

Sampling and Analysis Plan

Revision 0

**QEP VENEER
890 WEST HUNTINGTON STREET
MONTPELIER, INDIANA 47359**

CARDNO ATC PROJECT NO. 86.42684.028H

SEPTEMBER 23, 2013

Prepared by:

**Cardno ATC
7988 Centerpoint Drive, Suite 100
Indianapolis, Indiana 46256
Phone: (800) 488-2054
Fax: (317) 849-4278**

Prepared for:

**Ms. Pam Price
Program Development Coordinator
ECI Regional Planning District
1208 W. White River Boulevard, Ste. 112
Muncie, IN 47303**

Table of Contents

1	INTRODUCTION	1
2	BACKGROUND	2
3	SAMPLING AND ANALYSIS PLAN	3
3.1	UTILITIES	3
3.2	HEALTH AND SAFETY	3
3.3	WORK ZONES	3
3.4	INVESTIGATION LOCATIONS	4
3.5	SUBSURFACE INVESTIGATION PROCEDURES	4
3.5.1	<i>Soil Sampling</i>	4
3.6	ANALYTICAL PROCEDURES	5
3.7	DECONTAMINATION PROCEDURES	5
4	DATA QUALITY OBJECTIVES (DQOS)	6
4.1	FIELD OBSERVATIONS AND DOCUMENTATION	6
4.2	EQUIPMENT CALIBRATION	6
4.3	QA/QC SAMPLES	7
4.3.1	<i>Trip Blanks</i>	7
4.3.2	<i>Field Duplicates</i>	7
4.3.3	<i>Matrix Spike/Matrix Spike Duplicates (MS/MSD) or Laboratory Duplicates</i>	7
4.4	SAMPLE PACKAGING AND SHIPMENT	8
4.5	CHAIN OF CUSTODY PROCEDURES	9
4.6	LABORATORY QUALITY ASSURANCE AND DELIVERABLES	9
4.7	ANALYTICAL RESULTS	11
5	DATA QUALITY ASSESSMENT	12

Figures

Figure 1 – Proposed Boring Locations

Tables

Table 1 – Proposed Sampling Program

Appendices

Appendix A – Health and Safety Plan

1 Introduction

In accordance with a request by the ECI Regional Planning District, Inc. (ECI), Cardno ATC has prepared this *Sampling and Analysis Plan* (SAP) to investigate the *Recognized Environmental Conditions* (RECs) identified by Cardno ATC in the September 17, 2013 *Phase I Environmental Site Assessment* (Phase I) performed at the QEP Veneer property, located at 890 West Huntington Street in Montpelier, Indiana (Site). Specifically the RECs include the following:

- Cardno ATC observed two grinding oil drums located in the northwest corner of the main building that had visible staining and pooling on the concrete floor beneath them. The drums were approximately 15 feet from the lumber yard which consisted of bare soil. Additionally, drums were located on the concrete floor on shelving in the maintenance room in the north-central portion of the main building. Cardno ATC observed wood chips in the area beneath the drums and staining was evident around the wood chips. No cracks in the concrete or other potential pathways to the soil were noted in the maintenance room. Cardno ATC observed three 55-gallon oil drums in the southern portion of the storage / steam chest building. The drums were located on a spill control pallet on the concrete floor. Staining was observed on the drums and concrete approximately 10 feet from the lumberyard. Additionally, Cardno ATC noted dark staining near a lathe motor in the northwest portion of the main building. The motor abutted an exterior wall and dark staining was observed to potentially be migrating to the outside of the building in the lumberyard.
- Cardno ATC observed a wastewater ditch located north of the main building near the 8,000-gallon wood chip AST. The wastewater ditch appeared to originate from condensate produced by a vent pipe connected to the steam dryers. The wastewater appeared to have a greenish sheen and sparse vegetation, if any, was noted around the wastewater ditch. According to Mr. Erlewein, wood products containing the resin and bulk adhesive are placed in the steam dryers; therefore, the condensate may contain contaminants present in the adhesive.

The work and all documents prepared during this scope of work is being funded through the ECI Regional Planning District, Inc., Community-Wide Assessment Project, which received a U.S. Environmental Protection Agency (U.S. EPA) Hazardous Substance and Petroleum Grant (US EPA Grant No. BF-00E00933-0). This SAP has been prepared in accordance with Indiana Department of Environmental Management's (IDEM's) *Remediation Closure Guide* (2012) and provides an outline of the objectives, organization, functional procedures, and quality assurance (QA) and quality control (QC) protocols for sampling, sample handling and storage, chain of custody, and field/laboratory testing and analysis.

QA/QC procedures identified herein were developed to accommodate applicable professional technical standards, IDEM requirements, government regulations and guidelines, and specific project goals and requirements.

2 Background

A Phase I, dated September 17, 2013, identified the Site, located at 890 West Huntington Street in Montpelier, Blackford County, Indiana, as an operating manufacturing and warehousing facility. The Site is situated in a relatively flat area characterized by light industrial and agricultural land uses.

The property consists of a 19.4-acre parcel developed with a 95,000-square foot main building and a 6,300-square foot storage / steam chest building. The main building is "L" shaped and consists of a production area, warehouse area, offices, break room and a maintenance room. A lumberyard, water aboveground storage tanks, and water vats are located north of the production area. The storage / steam chest building is located on the west central portion of the property, northwest of the main building. The southern portion of the storage / steam chest building is used to store retired machinery, parts and miscellaneous items associated with on-site operations. A concrete pad for the storage and watering of lumber is located northeast of the storage / steam chest building. The lumberyard and lumber storage areas are drained by a retention pond on the northeastern portion of the property. An asphalt parking area is located to the south of the building and an asphalt drive is present on the east central portion of the property. The northern portion of the property consists of overgrown vegetation on the northwest and a retention pond on the northeast. The remaining areas of the property consist of maintained grass.

The property is currently occupied by QEP Company as a veneer and plywood manufacturer. Operations at the property include log watering, warming and steaming, log debarking, veneer lathe, drying, glue spreading and pressing. Logs are prepared for the veneer and plywood process by warming and steaming in one of the ten concrete lined water vats located north of the main building. Water is continually cycled through the vats and is treated, as needed, by a pH stabilizer. Additionally, the water is heated by a wood-fired boiler located on the northeast portion of the main building. A back-up gas boiler was observed but, according to the site contact, Mr. Joe Erlewein, the gas boiler is not used. After the logs are steamed and warmed, they are then brought into the main building, debarked and cut to size. The veneer sheets are produced with the lathe, dried and sent to the glue spreader. The resin bulk adhesive is applied to the veneer sheets and they are dried and sent to be pressed. The finished product is situated on pallets and stored in the warehouse for shipment. The remaining wood chips not used for the production of the veneers is stored in an aboveground storage tank outside the north side of the building and used for the wood-fired boiler.

On September 3, 2013, a Request for Eligibility was submitted to the US EPA, Region 5 for review and approval. The US EPA approved the Eligibility Determination Request on September 3, 2013.

The objective of the scope of work described in this SAP is to investigate the shallow soil quality in the vicinity of the RECs identified during the Phase I. Once the Site is characterized and the environmental issues are resolved, the Site will be used industrial purposes.

3 Sampling and Analysis Plan

This SAP describes sample collection and laboratory analysis of soil samples that will be collected to evaluate the current site conditions in comparison with the applicable IDEM Remediation Closure Guide (RCG) screening levels. Specifically, the results of the laboratory analyses will be compared to the IDEM RCG screening levels for both residential and commercial/industrial land use. This SAP is presented to define the field activities to be conducted and protocol to be followed in order to accomplish the Data Quality Objectives outlined in **Section 4.0**. This section is provided as guidance for the personnel assigned to conduct the activities and discusses in detail the procedures and specifications required to achieve the level of Quality Assurance (QA) necessary for the data generated. Clear sampling and analysis procedures must be used to ensure proper QA is adhered to and that field tasks are conducted to certify that all data generated is of sufficient quantity and quality to satisfy the project objectives. Accordingly, all field activities, including; boring, drilling and sampling operations, will be conducted or supervised under the direction of an Indiana Licensed Professional Geologist.

3.1 Utilities

Prior to initiating Site activities, Cardno ATC will contact the Indiana Underground Plant Protection Service (IUPPS) and request the member utilities to identify the underground utility locations in the rights-of-way surrounding the Site. If additional information is discovered during the course of the subsurface investigation, it may become necessary to utilize a private locating sub-contractor to locate the on-site utilities.

3.2 Health and Safety

The Health and Safety Plan (HASP) included within **Appendix A** has been developed to identify potential human health and worker hazards and to describe appropriate worker personal protective equipment and safety protocols. The HASP for subsurface investigation addresses worker safety during field sample screening, sample collection, and associated testing. The HASP also addresses potential field hazards related to heavy equipment operation and common biological exposures (snakes, ticks, poisonous plants, etc.). Personnel involved with the subsurface investigation will be required to hold a health and safety meeting prior to beginning work each day.

If the activities outlined within this SAP are conducted by others (not Cardno ATC), the attached HASP is considered void and Cardno ATC cannot be held legally liable for any accident or injuries sustained as a result of relying upon the attached HASP.

3.3 Work Zones

To reduce the accidental spread of potentially hazardous substances by workers and equipment, work zones will be established on the site where different types of operations will occur, and the flow of personnel among the zones will be controlled. The establishment of work zones will help ensure that personnel are properly protected against hazards present, work activities and

contamination are confined to the appropriate areas, and personnel can be located and evacuated in an emergency.

3.4 Investigation Locations

The subsurface investigation to evaluate the soil quality beneath the Site will include the collection and analysis of up to eight soil samples from four soil borings. Each soil boring will be advanced to a depth of 4 feet below the ground surface (ft-bgs). The proposed sampling locations are shown on **Figure 1**. Although the general soil boring layout has been developed to focus on areas most likely to have been adversely impacted by Site operations, the location of each soil boring will be determined in the field based on access and field conditions. The proposed soil boring locations and rationale are provided below:

- One soil boring will be advanced where staining was observed near the drum storage area in the Steam Chest/Storage Building.
- One soil boring will be advanced where staining was observed near the drum storage area in the Main Building.
- Two soil borings will be advanced in the vicinity of the steam vent pipe and drainage ditch along the north side of the Main Building.

3.5 Subsurface Investigation Procedures

Soil "grab" samples will be collected in accordance with IDEM RCG, as described in the Quality Assurance Project Plan (QAPP) Revision 1, dated March 21, 2012.

3.5.1 Soil Sampling

Each boring may initially be advanced using a stainless steel hand auger to a maximum depth of approximately four ft-bgs. Soil samples from a minimum of each 1-foot interval will be collected and characterized for potential submittal to the laboratory for analysis. Each sample collected will be labeled and placed in a cooler with ice for preservation following collection. A portion of each sample interval will also be placed into a re-sealable plastic bag for field headspace screening. Each soil sample will be inspected for physical evidence of contaminants such as staining, odors, free product, etc. Soil headspace measurements will be collected for the emission of total photo-ionizable vapors (TPVs) using a photo-ionization detector (PID) which measures TPVs in parts per million (ppm). The inspection information, soil field descriptions, and headspace emission measurements will be recorded on boring logs generated for each boring location.

The soil samples retained from each of the four soil borings will include the surface interval (0 to 0.5 ft-bgs) and the subsurface sample exhibiting the greatest potential for being impaired (i.e., highest TPV reading, staining, odors, etc.) based on field screening and/or field inspection.

The samples retained for analysis will be containerized with minimal headspace in sample containers provided by the laboratory, sealed using Teflon® lined caps, labeled with a unique identification, placed in an ice-packed cooler and transported to Pace Analytical

Laboratory located in Indianapolis, Indiana using appropriate chain-of-custody protocol. Soil samples to be analyzed for VOCs will be collected in accordance with SW846 Method 5035 (Indiana Modified). Laboratory analyses will be performed on a 24 hour turn around basis.

3.6 Analytical Procedures

The soil samples will be placed in the laboratory supplied containers, logged on a chain of custody, placed in a cooler with ice to maintain a temperature of approximately 4° Celsius, and transported to Pace Analytical Laboratory in Indianapolis, Indiana for analysis. The samples will be analyzed within the established holding times using U.S. EPA-approved Methods as described in the EPA publication, Test Methods for Evaluation of Solid Wastes, Physical/Chemical Methods (SW-846, 3rd Edition, Update III). The analytical tests listed below were determined following the review of previous subsurface investigations.

Up to eight soil samples (two per boring) will be analyzed for the following parameters:

- VOCs using US EPA SW-846 Methods 8260.
- Resource Conservation and Recovery Act (RCRA) metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver using US EPA Methods 6010B/7470.
- Polynuclear aromatic hydrocarbons (PAHs) using US EPA SW-846 Method 8270SIM.

In addition to the eight discrete soil samples, one duplicate soil sample, one trip blank, and one matrix spike/matrix spike duplicate sample will be analyzed. A summary of the proposed sampling program and applicable QA/QC samples is provided as **Table 1**.

The Method Detection Limits (MDLs) and Estimated Quantification Limits (EQLs) shall be low enough to determine if the reported COC concentrations, if any, are in excess of the RCG Screening Levels. Quality Assurance/Quality Control (QA/QC) shall be performed and submitted for review in accordance with the RCG, and in accordance with the **Level IV data package criteria** (Full Data Package).

At the time of sample submittal, the laboratory will be notified that the detection limits for analytical samples should be low enough to compare concentrations against the respective RCG Screening Levels.

3.7 Decontamination Procedures

Sampling equipment and supplies (i.e. gloves, hand augers, etc.) will be dedicated to a specific sample location, disposed of after use or decontaminated between sample collection. Sampling personnel are to wear clean latex or nitrile gloves at any time they are handling equipment or containers and will take all precautions to avoid contamination of equipment and supplies. The sampling equipment will also be cleaned between sample intervals using a solution of non-phosphate detergent and rinsed in portable water. Parts or surfaces of the portable non-dedicated equipment that come in contact with soil be decontaminated between sample collection points by washing with a non-phosphate detergent wash, followed by a rinse in potable water.

4 Data Quality Objectives (DQOs)

This section discusses DQO's for sampling and analysis of subsurface soil samples from the area of interest identified during the IDEM's site visits. The following types of data will be generated in the course of this investigation:

- Field observations and geologic and hydrogeologic conditions including soil characteristics, and chemicals of concern (COC) indicators;
- Field meter readings including those for measurement of TPV headspace screening;
- Field records of onsite activities including well construction, sample collection, sample handling, and other activities directly tied to the generation of data or the proper context of data; and
- Results of laboratory analysis of soil samples.

The quality objective for these data types are discussed below and in further detail in the Quality Assurance Project Plan (QAPP), Revision 01, dated March 21, 2012.

4.1 Field Observations and Documentation

Field documentation will be crucial to ensure the integrity of samples and the associated analytical results. For these sampling tasks, documentation will include field logbooks, field data collection forms, field meter calibration information, and chain of custody documentation. The quality of field observations of geologic and hydrogeologic conditions relies heavily on the training and experience of the personnel responsible for those activities. Criteria for performance are established through standard operating procedures for the applicable activities presented in **Section 3.0** (Sampling and Analysis Plan). The quality objectives for these data will be to maintain adherence to the applicable procedures and to maintain proper documentation.

4.2 Equipment Calibration

The quality of field meter readings relies on the proper calibration and operation of equipment. Equipment used to gather, generate, or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the manufacturer's specifications.

At a minimum, each instrument will be calibrated in the laboratory or office prior to each sampling event and operate in accordance with the manufacturer's specifications. Equipment used during the field sampling will be examined daily to certify that it is in operating conditions and calibrated according to manufacturer's instructions. If equipment malfunction is suspected and calibration failure occurs, equipment will be removed from service and substitute equipment will be obtained. Calibration activities will be recorded in the appropriate field forms or logbook(s).

4.3 QA/QC Samples

To provide for a measurement of the precision and accuracy of the sampling event, the following QA/QC samples will be submitted for analysis along with environmental media samples.

4.3.1 Trip Blanks

- 1) Intent: Expose handling or transportation induced deterioration of the sample.
- 2) Method: Before the start of sampling, the laboratory will provide water sample trip blanks. These blanks will be sent from the laboratory to the site, and will be submitted for analysis by the field sampling team. Trip Blanks will be analyzed for volatile organic compounds (VOCs) only.
- 3) Frequency: One trip blank will be submitted for each day of sampling and/or for each cooler used to store and transport samples for VOC analysis.

4.3.2 Field Duplicates

- 1) Intent: Expose deficiencies in the sample collection and laboratory analysis that influence sample precision.
- 2) Method: Field samples will be collected for a replicate analysis from selected sampling locations. The sample will be collected by filling double the amount of sample containers as called for in the sample plan. One set of samples will be identified as the sample. The second set will be identified as a field duplicate.
- 3) Frequency: One field duplicate will be collected and submitted for every 20 samples collected.

4.3.3 Matrix Spike/Matrix Spike Duplicates (MS/MSD) or Laboratory Duplicates

- 1) Intent: Evaluate laboratory precision, accuracy, representativeness, comparability and completeness (PARCC) of the data parameters generated during this investigation.
- 2) Method: MS/MSD samples will be collected for replicate analysis from selected sampling locations. The sample will be collected by filling triple the amount of sample containers as called for in the sample plan. One set of samples will be identified as the sample. The second and third sets will be identified as MS/MSD.
- 3) Frequency: One MS/MSD sample will be collected and submitted for every 20 samples collected.

	QC Sample Type	Frequency of Sample/Analysis	Details
Field Samples	Duplicate Samples	1 duplicate per 20 samples per matrix, or 1 duplicate per sample matrix if fewer than 20 samples.	Duplicate sample to be collected by the same methods at the same time as the original sample. Used to verify sample and analytical reproducibility.
	Trip Blanks	1 trip blank per cooler containing samples for VOC analysis for water samples.	Laboratory prepared organic-free blank to assess potential contamination during sample container shipment and storage.
		1 trip blank per day or per cooler.	Not required for samples collected with TerraCore
Lab Samples	Matrix Spike/ Matrix Spike Duplicate	1 MS/MSD per 20 or fewer samples per matrix	Laboratory spiked sample to evaluate matrix and measurement methodology.
	Method Blanks	1 method blank per batch of samples prepared, or per lab SOP	Laboratory blank sample to assess potential for contamination from laboratory instruments or procedures.
	Laboratory Control Samples and Duplicates	Analyzed as per method requirements and laboratory SOPs	Evaluates laboratory reproducibility.

4.4 Sample Packaging and Shipment

Once the field sampling crew has filled out all the appropriate sample labeling and custody documentation, the samples must be stored on ice, and shipped to the laboratory via courier. As the samples are assembled for shipment, the following steps will be conducted:

- 1) Follow all appropriate instructions for collecting the samples.
- 2) Tightly secure the lid of each sample container and confirm that the sample has been properly labeled with the date and time of sample collection.
- 3) Place each sample container inside bubble pack (if container is glass).
- 4) Place the sample containers inside the sample cooler.

- 5) Place bubble wrap, or other suitable material that will maintain its integrity if it gets wet, between each sample container to take up any void space.
- 6) Add ice in the cooler containing the samples.
- 7) Place a chain-of-custody and any other instructions inside a resealable plastic bag and place the bag inside the cooler.
- 8) Close the cooler and secure closed with shipping tape by running the tape around both ends of the cooler at least two times.
- 9) Place one custody seal across the front of the cooler.
- 10) Place address label with both the "Shipped From" and "Ship To" addresses on the top of each cooler.
- 11) Notify the laboratory that it will be receiving the samples.

4.5 Chain of Custody Procedures

Possession of samples collected during field investigations must be traceable from the time the samples are collected until they or their derived data are summarized used for data analysis, interpretation, and site decision-making. Chain of custody procedures will be followed to maintain sample accountability.

The custody form will document which individuals were in possession of the samples and when custody was transferred from one individual to another. Any deviations from sampling protocol will also be documented on the custody record. Additionally, the chain of custody form will double as a request for analysis form. The custody form will specify the type and number of bottles shipped, analysis to be performed and turnaround time requirements. The sample custody records will be part of the final report.

Whenever the custody of samples is transferred, the individuals relinquishing and receiving the sample will sign, date, and note the time on the record. Separate records will accompany each sample package shipped to the laboratory. The original custody form will accompany the samples and a copy will be retained by the sampling team.

When shipped by courier, the method of shipment and courier name will be noted in the remarks column. For ground or air courier shipments to the laboratory, the sampling team will complete the chain of custody, place it in the sampling cooler, and seal the cooler with shipping tape and a custody seal. Samples will not be relinquished to the shipping firm; rather, the unbroken custody seal will establish sample integrity during the time that the samples are in transit. Shipping return receipts, freight bills, and bills of lading will be retained as part of the sample custody documentation.

4.6 Laboratory Quality Assurance and Deliverables

The results of laboratory analyses are subject to the quality objectives of the Laboratory Quality Assurance Manual (QAM), which is available on request from the laboratory that is used to perform the analyses. The Laboratory QAM specifies methods for the maintenance and calibration of equipment, handling of samples, execution of test procedures, and other activities impacting the quality of the generated data.

Analytical results will be validated internally by the laboratory, according to laboratory procedures. The laboratory will assess the validity of sample results, along with duplicate, matrix spike/matrix spike duplicate (MS/MSD), and blank sample results. Laboratory validation is performed according to established internal quality control programs initiated by the laboratory.

Laboratory and field analytical results will be submitted in digital data files prepared in accordance with IDEM digital data format guidance. Hardcopy analytical reports will also be submitted.

Standard, or Level II, laboratory QA/QC reporting will be provided with the original analytical results. Level II laboratory data deliverables for performance monitoring samples will include:

- Date and time of sample receipt;
- Sample condition upon receipt;
- Sample identification number;
- Summary report of results (case narrative);
- Sampling, preparation and analysis data;
- Analytical and preparation methods used;
- Sample, duplicate sample, and blank results;
- Laboratory Control Sample results;
- Matrix spike/matrix spike duplicate results;
- Surrogate recoveries (for GC and GC/MS); and
- Signed Chain-of-Custody sheets for all samples.

In addition to the reporting elements listed above for Level II, Level III laboratory data deliverables will include summaries of:

- Instrument performance checks;
- Initial calibration data;
- Continuing calibration checks;
- Methods;
- Laboratory Control Samples;
- MS/MSD results;
- Surrogate recoveries;
- Internal standards;
- Retention times; and
- GC analytical sequence

In accordance with the RCG, if the laboratory results will be used for closure purposes, the final laboratory report will include additional QA/QC documentation, including raw data. This laboratory reporting level, referred to as Level IV, will accompany the analytical results submitted if requested.

The Level IV report will also include raw data for:

- GC/MS tuning;
- Continuing Calibration standards;
- Initial Calibration curves;
- Method blanks
- Laboratory Control Samples;

- MS/MSD samples;
- Sample Chromatograms and quantitative reports;
- GC/MS Spectra;
- Sample run logs; and
- Extraction logs.

4.7 Analytical Results

The data will be used to evaluate the soil quality relative to the IDEM RCG screening levels. If analytical results are found above the closure concentrations, additional soil and/or groundwater assessment and/or remediation may be necessary.

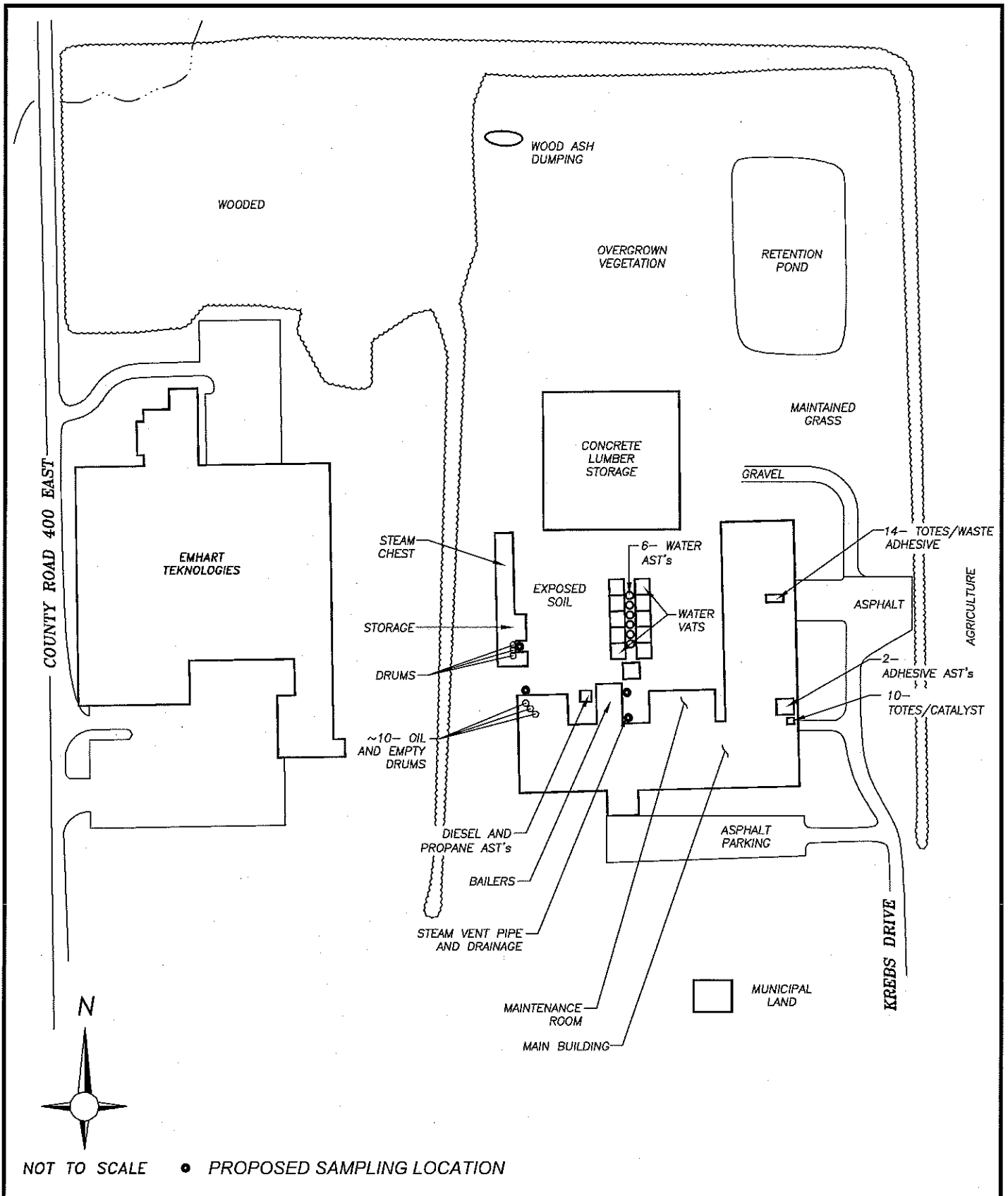
5 Data Quality Assessment

DQA involves assessing the effectiveness of the sample design, sampling procedure, and laboratory analysis. DQA is used to ensure that the sampling and analytical quality are adequate to meet the precision, accuracy, representativeness, comparability, and completeness (PARCC) requirements established in the DQOs. DQA identifies the review process needed to support project requirements and confirms that the field sampling QA/QC event, the field documentation, and the QA/QC samples provide useable data. DQA also evaluates the final results of the site investigation and compares them to the closure levels. Accordingly, DQA of field and laboratory data collection will include the following:

- Review of sampling design and data collection documentation;
- Review of field measurement results;
- Review of laboratory case narratives;
- Review of field duplicate results;
- Review of equipment blank results; and
- Review of MS/MSD results and blank results.

Comparison of soil concentrations to the IDEM RCG screening levels is part of the DQA process.

Figures



PROPOSED SAMPLING LOCATIONS

PHASE II ENVIRONMENTAL SITE ASSESSMENT
QEP VENEER
890 W. HUNTINGTON STREET
MONTPELIER, INDIANA

Project Number:
86.42684.028H

Drawing File:
42684~28H

Date:
9/13

Scale:
AS SHOWN

Drn. By:
SP

Ckd. By:
JC

App'd By:

Figure:



1

Tables

Table 1. Proposed Sampling Program, QEP Veneer, Mount Pelier, Indiana

Area of Concern	Sample Matrix	Data Usage	Number of Borings	Number of Samples	Field Parameters	Laboratory Parameters	Analytical Method
Drun Storage Area Steam Chest/Storage Building	Soil	Investigate Soil Quality	1	2	Qualitative screening; PID	Metals PAHs VOCs	6010B/7471 8270SIM 8260
Drun Storage Area Main Building	Soil	Investigate Soil Quality	1	2	Qualitative screening; PID	Metals PAHs VOCs	6010B/7471 8270SIM 8260
Steam Vent Pipe/Discharge	Soil	Investigate Soil Quality	2	4	Qualitative screening; PID	Metals PAHs VOCs	6010B/7471 8270SIM 8260
Duplicate sample	Soil	Investigate Soil Quality	NA	1	Qualitative screening; PID	Metals PAHs VOCs	6010B/7471 8270SIM 8260
Trip Blank	DI Water	Sample Integrity	NA	1	NA	VOCs	8260
Matrix Spike/Matrix Spike Duplicate Sample	Soil	Investigate Soil Quality	NA	1	NA	Metals PAHs VOCs	6010B/7471 8270SIM 8260

Notes:

NA - Not Applicable

Appendix A – Site Health and Safety Plan

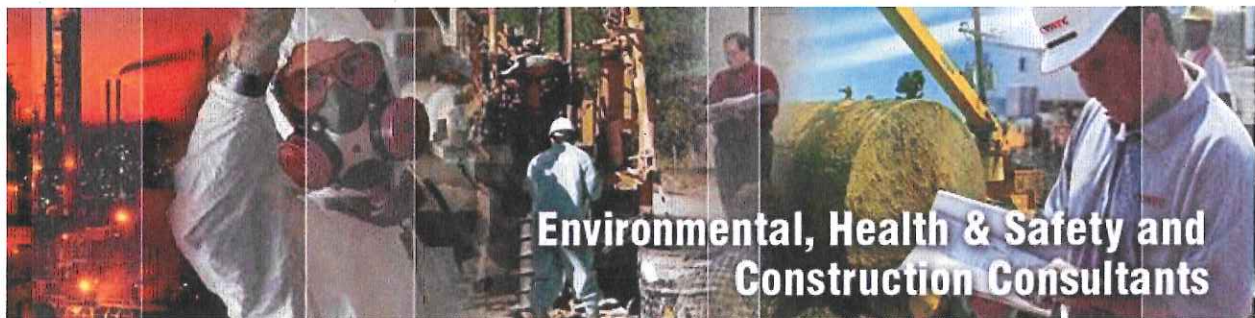


Shaping the Future

HEALTH AND SAFETY PLAN

Prepared By:
Cardno ATC

7988 Centerpoint Drive, Suite 100
Indianapolis, Indiana 46256



Prepared For:

ENERGIZE-ECI REGIONAL PLANNING DISTRICT

QEP VENEER

890 WEST HUNTINGTON STREET
MONTPELIER, INDIANA 47359

CARDNO ATC PROJECT NO. 86.42684.028H



**CARDNO ATC
HEALTH AND SAFETY PLAN (HASP)
REVIEW AND APPROVAL**

CLIENT ECI Regional Planning Districts

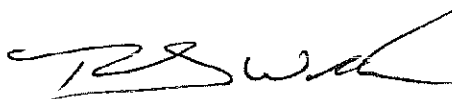
PROJECT NUMBER: 86.42684.028H

SITE NAME: QEP Veneer SITE LOCATION: Montpelier, IN

PROJECT DESCRIPTION: Conduct subsurface investigation, including the collection of near surface soil and subsurface soil samples.

PREPARED BY: Robert Walker Principal Geologist DATE: 9/22/13

Robert B. Walker
Project Manager


Signature

9/22/13
Date

Reviewer's Name

Signature

Date

This Health and Safety Plan (Plan) has been written for the use of Cardno ATC. (ATC) and its employees. It may also be used as a guidance document by properly trained and experienced ATC subcontractors. However, ATC does not guarantee the health or safety of any person entering this Site.

Due to the potential hazardous nature of this Site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards which may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury at this Site. The health and safety guidelines in this Plan were prepared specifically for this Site and should not be used on any other Site without prior research by trained health and safety specialists.

ATC claims no responsibility for use of this Plan by others. The Plan is written for the specific Site conditions, purposes, dates, and personnel specified and must be amended if these conditions change.

TABLE OF CONTENTS

	<u>Page No.</u>
1.0 INTRODUCTION.....	
1.1 Scope and Applicability of the Site Health and Safety Plan	1-1
1.2 Historical Overview	1-1
1.3 Visitors.....	1-2
1.4 Subcontractor Activities	1-2
2.0 PROJECT ORGANIZATION.....	
2.1 Site Safety and Health Officer (SSHO).....	2-1
2.2 Site Manager	2-1
2.3 Project Manager (PM).....	2-1
2.4 Regional Safety Coordinator (RSC)	2-2
2.5 Project Field Team.....	2-2
3.0 TASK/OPERATION HEALTH AND SAFETY RISK ANALYSIS SUMMARY	
3.1 Job Safety Analysis	3-1
3.2 Health Analysis and Chemical Risk Assessment	3-1
3.3 Risks Associated with Drilling and Subsurface Activities	3-1
3.4 Noise Hazards and Control.....	3-3
3.5 Biological Hazards	3-3
4.0 AIR MONITORING AND PERSONAL PROTECTION EQUIPMENT.....	
4.1 Site Air Monitoring Requirements.....	4-1
4.2 Action Levels for Personal Protection Equipment.....	4-2
4.3 Levels of Protection	4-4
4.4 Respiratory Protection	4-5
5.0 MEDICAL SURVEILLANCE PROGRAM.....	
5.1 Employee Medical Examinations	5-1
5.2 Heat Stress Program	5-1
5.2.1 Training	5-1
5.2.2 Fluid Replacement	5-1
5.2.3 Acclimatization	5-1
5.2.4 Rest Breaks.....	5-1
5.2.5 Heat Stress Monitoring	5-1
5.3 Cold Stress Program.....	5-3
5.3.1 Training	5-3
5.3.2 Environmental Monitoring.....	5-3
5.3.3 Protective Clothing and Rest Breaks	5-3
5.3.4 Identification and Treatment of Cold Stress.....	5-3
6.0 SITE SECURITY AND CONTROL	
6.1 Work Zones	6-1
6.2 Buddy System.....	6-2
6.2 Site Communication.....	6-3
6.3 Roadway Work Zones.....	6-4

TABLE OF CONTENTS

	<u>Page No.</u>
7.0 DECONTAMINATION PROCEDURES	
7.1 Personnel Decontamination	7-1
7.2 Equipment Decontamination	7-1
7.3 Disposition of Decontamination Wastes	7-2
8.0 STANDARD OPERATING PROCEDURES	
8.1 Personnel Precautions	8-1
8.2 Operations	8-1
9.0 CONTINGENCY PLAN	
9.1 Medical Emergencies	9-1
9.2 Emergency Equipment	9-2
9.3 Flammable Conditions	9-2
9.4 Site Evacuation Conditions	9-2
9.5 Emergency Communication System	9-2
9.6 Emergency Response Follow-up	9-3
10.0 EMPLOYEE TRAINING	
10.1 Pre-Assignment and Annual Refresher Training	10-1
10.2 Site Supervisor's Training	10-1
10.3 Site Safety Training and Briefing Topics	10-1
10.4 Visitors	10-1

APPENDICES

APPENDIX A - Job Safety Analysis

APPENDIX B - NIOSH Pocket Guide's Specific Chemical Information Sheets and MSDSs

APPENDIX C - List of Approved Amendments/Changes
 Acknowledgement/Agreement Form
 Visitors Log
 Tailgate Safety Meeting Form
 Air Quality Monitoring Record
 Equipment Calibration Log
 Checklist for Subsurface Clearance
 Monthly Heavy Equipment Safety Inspection Checklist
 Drill Rig Inspection Checklist

APPENDIX D - Excavating and Trenching

APPENDIX E - Lockout/Tagout Requirements and Procedures

EMERGENCY INFORMATION

Site Emergencies Call:

Ambulance 911

Fire: 911

Police: 911

Nationwide Call Before You Dig 811

Core Health Networks (24 hour First-Aid) (855) 282-6331

Poison Control Center: (800) 222-1222

National Response Center: (800) 424-8802

Spills: Local USEPA Office (800)-621-8431
State Health Department (800)-246-8909
State Environmental Agency (800) 451-6027

Hospital (260) 726-7131

Jay County Hospital
500 West Votaw Street,
Montpelier, IN.

See attached map for directions
Approximate travel time is 3 minutes.

EMERGENCY ASSEMBLY LOCATION: Southeast corner of site.

FIRST-AID MEASURES

In the event that personnel exhibit symptoms of exposure call COMP-CARE immediately in first-aid assessment process. The following procedures will be used:

Eye Contact: Flush eye immediately with copious amount of water for a minimum of 15 minutes. Repeat until irritation is eliminated and seek medical attention.

Skin Contact: Wash exposed area with soap and water for at least 15 minutes. If dermatitis or severe reddening occurs, seek medical attention.

Inhalation: Move the person into fresh air. If symptoms persist, seek medical attention.

Ingestion: Do not induce vomiting. Seek immediate medical attention.

Important Numbers:

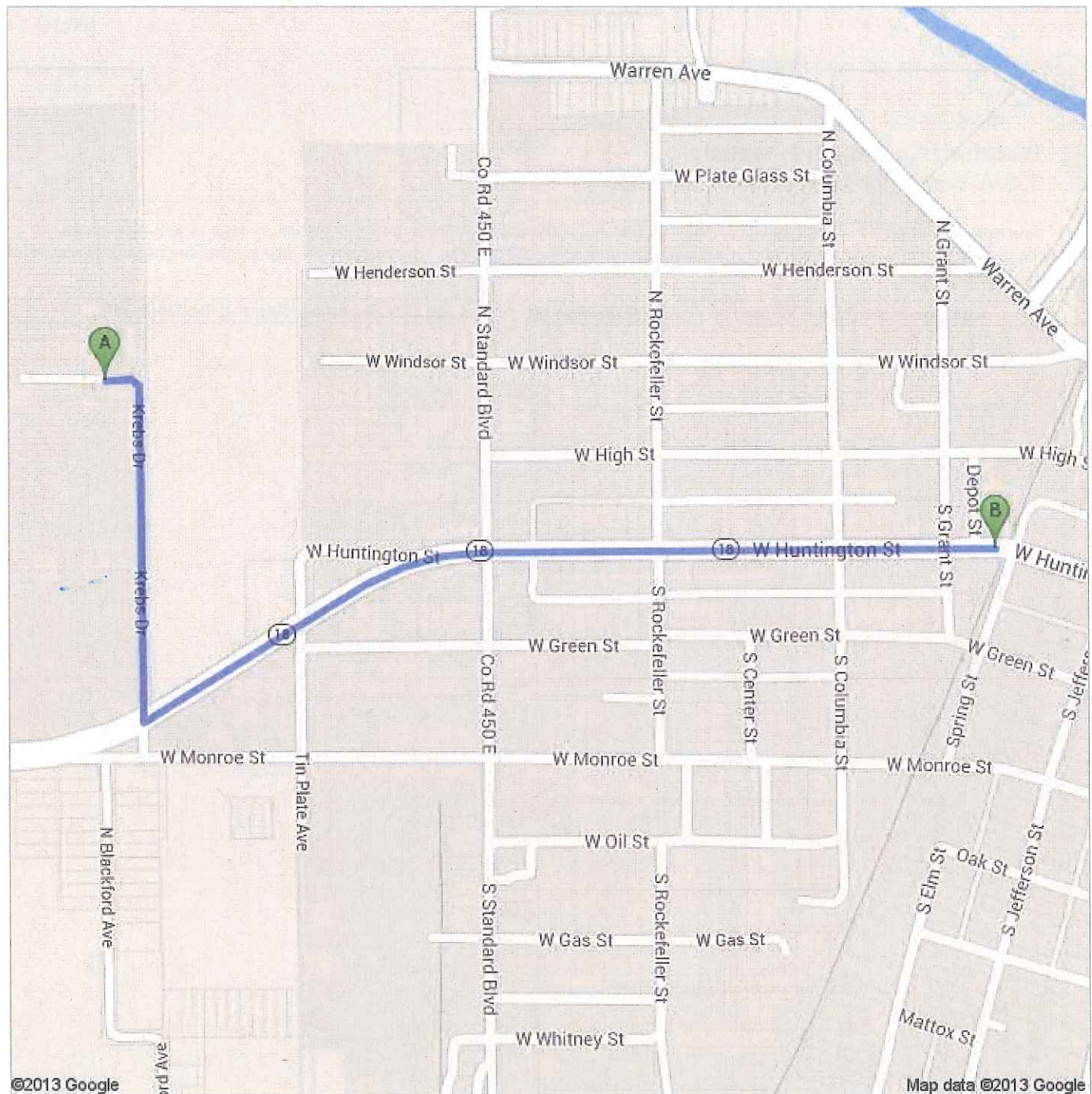
Project Manager:	Robert Walker	317-579-4057
Site Safety and Health Officer:	Julie Crewe	317-579-4012
Site Supervisor:	Julie Crewe	317-579-4012
Client Contact:	Pam Price	765-254-0116
Regional Safety Coordinator:	Nick Guidry	(337) 262-7977
State Utility Locate Service:	IUPPS	811

NOTE: For additional emergencies/important contacts, refer to your Cardno ATC Lifelines Card.

EMERGENCY MEDICAL ROUTE TO HOSPITAL

**Directions to Blackford Community Hospital**

300 W Huntington St, Montpelier, IN 47359

0.9 mi – about 3 mins



Krebs Dr, Montpelier, IN 47359

1. Head **east** on **Krebs Dr** toward **IN-18 W**

go 0.3 mi

total 0.3 mi



2. Take the 1st left onto **IN-18 E**

Destination will be on the left

About 2 mins

go 0.7 mi

total 0.9 mi



Blackford Community Hospital

300 W Huntington St, Montpelier, IN 47359

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2013 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

1.0 - INTRODUCTION

1.1 Scope and Applicability of the Site Health and Safety Plan

This Health and Safety Plan (HASP) has been prepared by Cardno ATC for the activities associated with the subsurface investigation at the Blackburn Auto Body, located in Montpelier, Indiana (Site).

The health and safety protocols established in this Plan are based on the Cardno ATC Employee Health and Safety Policy Manual, the Occupational Safety and Health Administration (OSHA) Regulations, past field experiences, specific Site conditions, and chemical hazards known or anticipated to be present from available Site data. The following Site Health and Safety Plan (HASP) is intended solely for use during the proposed activities described in the project documents and technical specifications. Specifications herein are subject to review and revision based on actual conditions encountered in the field during Site characterization activities. Such changes may be instituted by using the HASP List of Approved Amendments and/or Changes (see Appendix C).

Before Site operations begin, all employees, including subcontractors for Cardno ATC covered by this plan, involved in these operations will have read and understood this HASP and all revisions. All Site personnel have the authority to "Stop Work" if unsafe conditions are present or discovered during Site activities. Before work begins, all affected workers will sign the Health and Safety Plan Acknowledgment Form (see Appendix C). By signing this form, all individuals recognize the requirements of the HASP, known or suspected hazards, and will adhere to the protocols required for the project Site.

1.2 Historical Overview

A Phase I, dated September 17, 2013, identified the Site, located at 890 West Huntington Street in Montpelier, Blackford County, Indiana, as an operating manufacturing and warehousing facility. The Site is situated in a relatively flat area characterized by light industrial and agricultural land uses.

The property consists of a 19.4-acre parcel developed with a 95,000-square foot main building and a 6,300-square foot storage / steam chest building. The main building is "L" shaped and consists of a production area, warehouse area, offices, break room and a maintenance room. A lumberyard, water aboveground storage tanks, and water vats are located north of the production area. The storage / steam chest building is located on the west central portion of the property, northwest of the main building. The southern portion of the storage / steam chest building is used to store retired machinery, parts and miscellaneous items associated with on-site operations. A concrete pad for the storage and watering of lumber is located northeast of the storage / steam chest building. The lumberyard and lumber storage areas are drained by a retention pond on the northeastern portion of the property. An asphalt parking area is located to the south of the building and an asphalt drive is present on the east central portion of the property. The northern portion of the property consists of overgrown vegetation on the northwest and a retention pond on the northeast. The remaining areas of the property consist of maintained grass.

The property is currently occupied by QEP Company as a veneer and plywood manufacturer. Operations at the property include log watering, warming and steaming, log debarking, veneer lathe, drying, glue spreading and pressing. Logs are prepared for the veneer and plywood process by warming and steaming in one of the ten concrete lined water vats located north of the main building. Water is continually cycled through the vats and is treated, as needed, by a

pH stabilizer. Additionally, the water is heated by a wood-fired boiler located on the northeast portion of the main building. A back-up gas boiler was observed but, according to the site contact, Mr. Joe Erlewein, the gas boiler is not used. After the logs are steamed and warmed, they are then brought into the main building, debarked and cut to size. The veneer sheets are produced with the lathe, dried and sent to the glue spreader. The resin bulk adhesive is applied to the veneer sheets and they are dried and sent to be pressed. The finished product is situated on pallets and stored in the warehouse for shipment. The remaining wood chips not used for the production of the veneers is stored in an aboveground storage tank outside the north side of the building and used for the wood-fired boiler.

The Site is situated in a relatively flat area characterized by light industrial and agricultural land uses.

On September 3, 2013, a Request for Eligibility was submitted to the US EPA, Region 5 for review and approval. The US EPA approved the Eligibility Determination Request on September 3, 2013.

The objective of the scope of work described in this SAP is to investigate the soil quality at the in the vicinity of the RECs identified during the Phase I. Once the Site is characterized and the environmental issues are resolved, the Site will continue to be used as light industrial land.

The following *Recognized Environmental Conditions (RECs)* identified by Cardno ATC in the August 7, 2013 Phase I Environmental Site Assessment (Phase I):

- Cardno ATC observed two grinding oil drums located in the northwest corner of the main building that had visible staining and pooling on the concrete floor beneath them. The drums were approximately 15 feet from the lumber yard which consisted of bare soil. Additionally, drums were located on the concrete floor on shelving in the maintenance room in the north-central portion of the main building. Cardno ATC observed wood chips in the area beneath the drums and staining was evident around the wood chips. No cracks in the concrete or other potential pathways to the soil were noted in the maintenance room. Cardno ATC observed three 55-gallon oil drums in the southern portion of the storage / steam chest building. The drums were located on a spill control pallet on the concrete floor. Staining was observed on the drums and concrete approximately 10 feet from the lumberyard. Additionally, Cardno ATC noted dark staining near a lathe motor in the northwest portion of the main building. The motor abutted an exterior wall and dark staining was observed to potentially be migrating to the outside of the building in the lumberyard.
- Cardno ATC observed a wastewater ditch located north of the main building near the 8,000-gallon wood chip AST. The wastewater ditch appeared to originate from condensate produced by a vent pipe connected to the steam dryers. The wastewater appeared to have a greenish sheen and sparse vegetation, if any, was noted around the wastewater ditch. According to Mr. Erlewein, wood products containing the resin and bulk adhesive are placed in the steam dryers; therefore, the condensate may contain contaminants present in the adhesive.

This project consists of the collection of near surface and subsurface soil samples in the areas of concern at the Site.

1.3 Visitors

All visitors to the Site must be instructed about the hazards of the activities that Cardno ATC or its subcontractors are performing. All visitors must sign the Cardno ATC Visitors Log (see Appendix C).

1.4 Subcontractor Activities

All subcontractors used at the Site have been Pre-Approved in the Cardno ATC Subcontractor Prequalification System.

2.0 - PROJECT ORGANIZATION

All personnel and visitors who may enter work areas on this Site must comply with the requirements of this HASP. All Site personnel have the authority to "Stop Work" if unsafe conditions are present. The specific responsibilities and authority of management, safety and health, and other personnel on this Site are detailed in the following sections.

2.1 Site Safety and Health Officer (SSHO)

The Site Safety and Health Officer (SSHO) has the responsibility and authority to develop and implement this HASP and to verify compliance. The SSHO reports to the Project Manager. The SSHO is on-site during all work operations and has the responsibility to halt Site work if unsafe conditions are detected. The responsibilities of the SSHO at the Site include the following:

- Managing the health and safety functions on the Site;
- Ensuring Site monitoring, worker training, and effective selection and use of PPE;
- Conducting daily Tailgate Safety Meetings for Site personnel and subcontractors and summarize the training on the Tailgate Meeting Form (see Appendix C). The following topics should be covered during safety meetings:
 - Hazard Communication (i.e., MSDS location, and container labeling, chemical hazards of non-routine tasks)
 - Determine applicability of Standard Operating Procedures (SOP) in Section 8 and communicate procedures
 - Review Site safety requirements
 - Give refresher training on heat or cold stress (Section 5.2 and 5.3) when appropriate
 - Review Site emergency procedures
 - Discuss location and use of a rig kill switch for drilling/boring operations
- Conducting daily safety inspections of the Site looking for unsafe acts or conditions and providing corrective action as appropriate.

2.2 Site Supervisor

The Site Supervisor is responsible for field operations and reports to the Project Manager. The Site Supervisor is the On-site Coordinator and overseer of operations. It is the Site Supervisor's duty to maintain Site security, supervise the personnel on the Site, coordinate the activities of the subcontractor personnel, and check that the HASP is followed and modified when necessary. The Site Supervisor's specific responsibilities include:

- Executing the work plan and schedule as detailed by the Project Manager
- Coordination with the SSHO on health and safety issues
- Ensuring Site work compliance with the requirements of the HASP
- Before Site activities, contact the hospital emergency room, local fire department, and local police department, as applicable. If outside town, contact county officials and local emergency services.

2.3 Project Manager (PM)

The Project Manager (PM) has the primary responsibility for the fulfillment of the terms of the contract and overseeing operations for the purpose that includes meeting legal and safety requirements. It is the PM's responsibility to keep the project on schedule, within budget, and communicate with the Client regarding the progress toward specified goals.

The PM will inform the Regional Safety Coordinator of all HASP modifications, violations, injuries, exposures, and near-miss situations. The PM responsibilities include:

- Provide personnel time to read and understand the Site Health and Safety Plan (HASP) before fieldwork.
- Conduct project start-up health and safety briefing for: Field personnel, the Site Supervisor, the project team.
- Check that each subcontractor is pre-approved and that each subcontractor's Site workers have appropriate HAZWOPER Training Certificates.
- Check that Site personnel, if required, have received Respiratory Protection Training, Fit testing, and physician's approval to wear a respirator.
- That hazards identified during any Site audits are corrected. If necessary for immediate hazards, shut down field operations if hazards can not be corrected or the hazards present an immediate threat to life and health.

2.4 Regional Safety Coordinator (RSC)

The Regional Safety Coordinator (RSC) is responsible for providing professional health and safety advice and oversight management to the project. The RSC will review and provide support for concerns regarding the health and safety of field personnel assigned to this project, including:

- If requested by the Project Manager, approval of Routine HASP;
- Approval of all Non-Routine HASP;
- Review of incident reports, inspections, and air monitoring results;
- When required, the RSC will conduct a field audit of the Site to evaluate the adequacy of the program and implement the necessary changes through the HASP.

2.5 Project Field Team

The Project Team includes technicians, engineers, scientists, geologists, and possibly subcontractors who perform field activities. Each individual team member will be responsible for understanding and personally complying with the HASP and Site health and safety requirements. Project Team members will report health and safety violations to either the Site Supervisor or the SSHO. Health and safety responsibilities, as discussed in this Plan, which are shared by all Site personnel include:

- Complying with the requirements of the HASP
- Reporting unsafe acts or conditions
- Retain copies at the Site of the following health and safety records:
 - Current HAZWOPER Training Certificate.
 - Respiratory Protection Training Certificate and current fit test record for potential respirator users.
 - Physician's approval for hazardous-waste fieldwork and/or respirator use.
 - First-aid/CPR and bloodborne pathogens training certificate.

3.0 – TASK/OPERATION HEALTH AND SAFETY RISK ANALYSIS SUMMARY

This chapter of the HASP describes the safety and health hazards associated with the Site work and control measures selected to protect workers. The purpose of the Job Safety Analysis (JSA) is to identify the routine safety and health hazards associated with the routine Site tasks and operations. Using this information, appropriate control methods are selected to eliminate the identified risks or effectively control them.

3.1 Job Safety Analysis (JSA)

Each specific JSA appears on a separate copy of the spreadsheets in Appendix A. A single JSA may be used for a task/operation performed in multiple locations if the hazards, potential exposures, and controls are the same at each location.

3.2 Health Analysis and Chemical Risk Assessment

Chemicals may be purchased and transported to the Site to support Site characterization and remediation operations. The principal chemical contaminants at the Site are expected to be petroleum, organic compounds, and metals. Appendix B contains information from the National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards about each of these chemicals. Additionally, the Hazard Communication Program (Policy No. 21) requires Cardno ATC to provide employees, contractors, subcontractors, and visitors with information on the health effects of these chemicals and necessary actions to protect against exposure. This information is transmitted through Material Safety Data Sheets (MSDS), the NIOSH Pocket Guide, container labels, training, and a written Hazard Communication program.

Site activities will adhere to the Cardno ATC Hazard Communication Program as described in the Policy. All Site personnel, including subcontractors, will be briefed on this Program as part of the Site orientation training before starting work. In accordance with this Program, the PM and Site Supervisor will check that each chemical brought to the Site is accompanied by its MSDS. A copy of each MSDS will be made available to each Site employee who may be potentially exposed to the chemical. In addition, the Site Supervisor will check that all subcontractors bring at least one copy of MSDS for each chemical they bring onto the Site. The Site Supervisor will also check that all chemical containers brought to the Site to determine if they are labeled as to its contents and appropriate hazard warnings.

3.3 Risks Associated With Drilling and Subsurface Activities

Drilling operations will conform to the Job Safety Analysis and Subsurface Investigation (Cardno ATC (Policy No. 33)). During drilling operations, the subsurface is penetrated to obtain soil and/or groundwater samples. Contaminated soil cuttings and groundwater may be brought to the surface, creating a potential for exposure through skin contact and inhalation of vapors. The open borehole also creates a conduit for vapors to be released to the atmosphere. However, the amount of vapors released to the atmosphere is relatively small and vapors are usually quickly diluted and dispersed in air. Air monitoring is required to determine if protective equipment is necessary, as described in Section 4.0 of this HASP.

In addition to these chemical risks, the risk of drilling into a buried utility, such as a gas, water, electric line, or underground storage tank or other structures, is always present. Complete the Checklist for Subsurface Clearance prior to any subsurface work (see Appendix C) and follow the procedures in Table 3-1 for at least the first 5 feet of penetration:

TABLE 3-1
DRILLING/PROBING PROCEDURES
(First 5 feet below surface)

Step 1 - Site Walk	Conduct Site walk. Verify that the Checklist for Subsurface Clearance has been fully completed.
Step 2 - Locate Markouts	Locate all utility markouts and borehole locations. Start intrusive activities at least five (5) feet away and perpendicular to all marked utility lines.
Step 3 - Break Surface Cover	Use a jackhammer or concrete saw to break through the asphalt or concrete surface cover. The drill bit on the rig may also be used on the asphalt cover. Do NOT advance bit or cutting tools beyond the asphalt or concrete cover.
Step 4 - Surface Boring	<p>Use air knife with vacuum extractors, hand auger, or hand shovel to remove soil from the borehole to a depth of at least 5 feet below surface. The soil in the borehole should be excavated to a diameter of at least three inches greater than the diameter of the drill bit on the lead auger or drill stem that is to be used.</p> <p>If it is not possible to perform a surface boring which meets the diameter requirements as stated above, surface borings should be installed to the required depth of 5 feet surrounding the proposed well/boring location in such a manner that any lines/utilities passing through the proposed well/boring location will be encountered while installing the investigation borings/well.</p> <p>If pea gravel, fill material, or refusal is encountered, and was not expected to be encountered, abandon the boring and follow instructions from item #9 of section 5.4.1.</p>
Step 5 - Soil Sampling	If soil samples are required to be collected within the first 5 feet below surface, a hand auger should be utilized to collect native, undisturbed soil samples.
Step 6 - Borehole Protection	If no piping or other structures are encountered within the first 5 feet below surface, normal drill/probe activities may proceed with <u>caution</u> . Containerize drill cuttings as appropriate. If excavation of the borehole is conducted the day before actual drilling is conducted, the borehole should be covered with barricades or cones and with a sheet of material sufficient in strength to support a person's weight until it is ready to be drilled. If the borehole is of sufficient size to potentially cause damage to a vehicle if driven over, the borehole should be covered with a material sufficient in strength to support vehicular weight. In lieu of barricades or cones and a material cover, the boring may be temporarily backfilled to surface. If a backfill material is utilized, it is important for the material to be flush with the surrounding pavement.

Risks of injury associated with the drilling operation itself also exist. The risks of working near overhead electrical lines may also present a safety hazard. The SSHO will check for the presence of overhead lines and other obstructions. No drilling operations will be performed

within 10 feet of overhead lines with voltages 0-50 kV. For other voltages refer to Cardno ATC Electrical Safety Policy (No. 12) and Equipment (Drill Rigs, Mobile Equipment) Policy (No. 15).

Whenever possible, stay at least two feet from turning or rotating machinery. This includes augers, cathead, engine power takeoff, and drill rods. Learn where the rig kill switch is to shut the rig off in case of an emergency. A discussion should be held with the driller on each drill rig at the startup of the field work to discuss the location and use of the kill switch and for documentation of a Safety Inspection such as the Monthly Heavy Equipment Safety Inspection Checklist found in Appendix C.

3.4 Noise Hazards and Controls

Exposure to high levels of noise may occur when working near drill rigs or other heavy equipment. Also, depending upon where the work is being performed, local equipment (e.g., airports, factory machines, etc.) may produce high levels of noise. Employees exposed to noise levels in excess of the action level of 85 decibels (A-weighted, Slow Response) will be included into the Cardno ATC Policy on Hearing Conservation (Policy No. 34). The SSHO may evaluate employee noise exposures using a Noise Survey Meter or a Noise Dosimeter. The RSC may conduct additional noise monitoring to determine the appropriate response to be taken. Employees will be provided with ear plugs and/or earmuffs when exposed to noise levels in excess of the 8-hour Permissible Exposure Limit (PEL) of 90 decibel (A-weighted, Slow Response). This hearing protection shall have a Noise Reduction Rating (NRR) to protect hearing in accordance with Policy No. 34, including the NRR de-rating factor of $[(NRR-7)/2]$.

3.5 Biological Hazards

Site activities on this Site may expose workers to other hazards such as poisonous plants, insects, animals, and indigenous pathogens. Protective clothing and respiratory protection equipment, and being capable of identifying poisonous plants, animals, and insects, can greatly reduce the chances of exposure. Thoroughly washing any exposed body parts, clothing, and equipment will also protect against infections. If working in wooded/grassy areas, use appropriate insect repellants (containing DEET and/or Permethrin) and apply them per the manufacturers' directions.

4.0 - AIR MONITORING AND PERSONAL PROTECTIVE EQUIPMENT

4.1 Site Air Monitoring Requirements

To prevent exposure to hazardous conditions and aid in the selection of personal protective equipment, monitoring for the presence of airborne contaminants will occur when knowledge of the Site indicates their potential presence. One or more of the following direct-reading instruments may be used to aid in this determination. Photoionization Detectors (PID) and Flame Ionization Detectors (FID) will measure non-specific organic gases and vapors. Combustible Gas Indicators (CGI) will detect explosive atmospheres. Oxygen (O₂) meters will detect fluctuations in oxygen concentrations. These instruments should be calibrated or bump tested daily and whenever the readings may be erratic. All readings should be recorded in the field log books.

Colorimetric detector tubes supplement PID and/or FID readings to measure specific gases and vapors. Other direct-reading instruments are available for use to monitor for the presence of specific airborne Site contaminants.

The breathing zone of the employee(s) anticipated to have the highest potential for exposure for each task will be monitored using an appropriate combination of some or all of these direct-reading instruments. Air monitoring will occur every 15 minutes during non-intrusive activities, or every 5 feet of penetration during intrusive activities. Site tasks and air monitoring requirements are shown in Table 4-1. Additional Site monitoring may occur at the discretion of the SSHO, Site Supervisor, or RSC.

NOTE: All air monitoring equipment must be calibrated as per manufacturer's instructions.

Table 4-1
Site Air Monitoring Requirements

Site Activity	Instrument	Frequency	Location	Caution
Drilling	PID	Every 15 minutes or 5 feet of penetration	In breathing zone of person nearest activity	Communicate with equipment operator before sampling
	CGI	Every 15 minutes or 5 feet of penetration	In work area near activity	Communicate with equipment operator before sampling
	Detector tubes	As indicated in Table 5-2 when exceed PID limits	In breathing zone of person nearest activity	Strong odors may require further testing.
Ground water sampling	PID	Every 15 minutes	In breathing zone of person nearest activity	Strongest likely concentration when opening cover
	CGI	Every 15 minutes	In work area near activity	Strongest likely concentration when opening cover
	Detector	Every 15 minutes	In breathing zone	Strongest likely

Site Activity	Instrument	Frequency	Location	Caution
	tubes		of person nearest activity	concentration when opening cover

Air monitoring results obtained from the breathing zone during field activities will be recorded in field logbooks and the Air Quality Monitoring Record (see Appendix C). All such records will also include the location, date/time, weather conditions, person monitored, background concentration, and identification of specific contaminant whenever possible. Air monitoring information will be utilized to evaluate personnel exposure and assess the appropriateness of PPE for Site conditions. The PPE for the Site are discussed in Section 4.2. Photoionization detector (PID), combustible gas indicator (CGI), and detector tube readings measured in the employees breathing zone will be used to determine the level of protection required. PID readings refer to readings above background, which are sustained for at least 5 minutes and are measured during the performance of field tasks. PID readings are used for general screening.

4.2 Action Levels for Personal Protection Equipment

The first and foremost means of protecting employees from injuries or exposures is to eliminate the exposure. The general hierarchy for controlling potential exposures is: (1) Engineering Controls; (2) Administrative Controls; and (3) the use of PPE. PPE is a means of preventing injury or exposure when exposure elimination and/or other control means are not feasible.

The initial level of protection and the Action Levels at which the PPE will be upgraded are determined based on the identification of specific chemicals expected to be present at a Site and the established OSHA Permissible Exposure Levels (PEL) or ACGIH Threshold Limit Values (TLVs), whichever is lower. In the event more than one chemical is expected or exists at a Site, the most hazardous chemical will dictate the level of personal protection required. Table 4-2 shows the action levels for levels of personal protection equipment.

Table 4-2
Action Levels for Personal Protection Equipment

Monitoring Equipment	Hazard	Action Level Above Background	Action
PID/FID	Organic gas/vapor	< 10 ppm	Level D.
		10 to 50 ppm	Level C. Move upwind and continue air monitoring, cease operations, or use detector tube(s) and reference Table 4-3 below.
		> 50 ppm	Immediate Withdrawal. Contact the PM and RSC for further instructions to proceed.

Detector tubes to be used are indicated for given ranges based upon the PID readings (Table 4-2). As appropriate, PID readings in conjunction with detector tubes will be utilized during the field activity and location anticipated having the highest level of contamination. This location will be selected by the Site Supervisor. If these measurements indicate exposure levels appropriate for Level D work, the use of detector tubes will be limited to situations where field conditions or activities have changed. Detector tubes will be available for use at the discretion of the Site Supervisor and the SSHO.

If readings exceed the range for level of protection indicated, personnel should withdraw and not return until an appropriate level of protection has been donned. Upgrading protection shall be communicated to the SSHO, who will in turn convey this information to the RSC. Upon review of PID, CGI, and detector tube measurements, the RSC may further adjust the PPE requirements.

Any upgrading to higher levels of protection may require additional personal sampling using National Institute for Occupational Safety and Health (NIOSH) or Occupational Safety and Health Administration (OSHA) methods for the collection and analysis of airborne contaminants.

Air monitoring equipment used on the Site should be calibrated with the following:

Calibration/Response Check

<u>Types</u>	<u>Frequency</u>	<u>Gas Standard</u>
PID	Daily	100 ppm isobutylene in air
CGI	Daily	Pentane/Methane
Universal Test Pump- Sensidyne (refer to mfg. for other pumps)	Daily	Leak Test: Insert unbroken detector tube into orifice, pull and lock handle in sampling position, wait 15-30 sec. Slowly and carefully release the handle. If handle does not return to 1/8", pump leaks.

Field personnel, in conjunction with the Site Supervisor and SSHO, may choose to allow ventilation of vapors before resuming work (rather than using higher levels of PPE). If ventilation is conducted, additional air monitoring will be performed prior to the resumption of work to determine the level of PPE required.

4.3 Levels of Protection

Levels of protection for Site activities are described on the Site Air Monitoring Summary. The protection levels may include all or some of the following, based on work scope.

Level D:

- Work uniform – Long pants and shirt with sleeves (no tank tops) – refer to Policy No. 25 Personal Protective Equipment (Section 5.5)
- Disposable, inner nitrile gloves
- Chemical-resistant boots with steel toe
- Safety glasses with side shields
- High Visibility Reflective Vest Class 1, Class 2, or Class 3 (select based on Traffic speed)
- Hard hat
- Disposable, chemical-resistant outer boot covers*
- Hearing protection*

LEVEL C:

- Half-face or full-face, air purifying respirator (NIOSH approved)
- Disposable, hooded, chemical-resistant clothing

- Disposable, chemical-resistant outer gloves
- Disposable, inner nitrile gloves
- Chemical-resistant boots with steel toe
- Disposable boot covers
- Hard hat
- Safety Glasses with side shields
- High Visibility Reflective Vest Class 1, Class 2, or Class 3 (select based on Traffic speed)
- Coveralls*
- Hearing protection*

(* Optional Equipment, depending on conditions/exposures)

4.4 Respiratory Protection

Respiratory protection requirements are described in detail in the Cardno ATC Respiratory Protection Program. Basic rules of respiratory usage are listed below:

- Facial hair that interferes with a satisfactory fit of the mask-to-face seal is not allowed on personnel required to wear respirators.
- Respirator cartridges should be replaced after approximately 8-hours of continuous or intermittent usage, unless otherwise noted. Cartridges should also be replaced if they become damaged, after the expiration date is exceeded, if vapor smell breakthrough occurs, or if filters become clogged causing resistance to breathing.
- Contact lenses may be worn when respiratory protection is required, in conjunction with additional eye protection to protect against particles or splashes, provided there is no interference with the respirator seal.
- Respirators shall be cleaned and disinfected after each day's use or more often, if necessary.
- Prior to donning, respirators will be inspected for worn or deteriorated parts. Emergency respirators or self-contained devices will be inspected at least once a month and after each use.
- After donning, personnel should perform a positive and negative user fit-check to determine if a good seal has been achieved.
- Each employee shall make sure that they have an annual respirator fit test and respiratory protection training.

5.0 - HEALTH SURVEILLANCE PROGRAM

5.1 Employee Medical Examinations

All employees involved in work at the Site will participate in Cardno ATC's Medical Surveillance Program administered by Health Resources. Additionally, when respirators are required (as determined by the SSHO and project manager), each employee will also have current respirator clearance.

A post project, follow-up exam may be required if an exposure incident is reported or an employee shows specific symptoms associated with the known or suspected hazardous chemicals. The RSC and the Project Manager will determine when post project exams are required.

5.2 Heat Stress Program

This procedure applies to all employees when heat stress conditions exist at project sites.

5.2.1 Training

The SSHO will have received acceptable training in first-aid and Cardiopulmonary Resuscitation (CPR), including training in heat-related illnesses. The SSHO shall also be trained on the requirements of the Cardno ATC Policy for Industrial Hygiene (Policy No. 23), which contains the requirement for Heat Stress monitoring. All workers should be capable of recognizing and treating the signs and symptoms of heat stress conditions. During potential heat stress conditions, ice should be readily available to rapidly cool victims.

5.2.2 Fluid Replacement

Water will be made available at the Site for employee fluid replacement. When heat stress is determined to be a problem by the SSHO, employees will be provided with balanced, electrolyte solutions to replace fluid and electrolyte loss. Employees will be provided with replacement fluids at a minimum rate of 8 ounces every 15 to 20 minutes per person.

5.2.3 Acclimatization

Acclimatization is a gradual physiological adaptation that improves an individual's ability to tolerate heat stress. Full-heat acclimatization requires up to 3 weeks of continued physical activity under heat-stress conditions similar to those anticipated for the work. Its loss begins when the work activity in the heat stress conditions is discontinued. A noticeable loss usually occurs within 3 – 4 days.

5.2.4 Rest Breaks

When heat stress conditions are applicable, all rest breaks should be taken out of the zone of exclusion into a cooler, shaded, rest area. If these conditions are not available, more frequent rest breaks will be taken.

5.2.5 Heat Stress Monitoring

Heat Stress and heat strain are conditions resulting from environmental factors including temperature, relative humidity, radiant heat transfer, and air movement, as they are affected by clothing. The primary objective of the heat stress management program is to prevent heat stroke which is life threatening and the most serious of the heat-induced disabilities. Extra caution should be taken for workers who are not acclimated to working in the heat.

The following Heat Stress Index (refer to Cardno ATC Policy No. 23) should be used as a guide to evaluate heat stress situations. If the Heat Stress exceeds 105° F, contact the RSC prior to work for detailed guidance.

Heat Stress Index									
Temp. °F	Relative Humidity								
	10%	20%	30%	40%	50%	60%	70%	80%	90%
105	98	104	110	120	132				
102	97	101	108	117	125				
100	95	99	105	110	120	132			
98	93	97	101	106	110	125			
96	91	95	98	104	108	120	128		
94	89	93	95	100	105	111	122		
92	87	90	92	96	100	106	114	122	
90	85	88	90	92	96	100	106	114	122
88	82	86	87	89	93	95	100	106	115
86	80	84	85	87	90	92	96	100	109
84	78	81	83	85	86	89	91	95	99
82	77	79	80	81	84	86	89	91	95
80	75	77	78	79	81	83	85	86	89
78	72	75	77	78	79	80	81	83	85
76	70	72	75	76	77	77	77	78	79
74	68	70	73	74	75	75	75	76	77
NOTES: Add 10° F when protective clothing is being used; Add 10° F when in direct sunlight									

HSI Temp	Category	Injury Threat
Above 130° F	Extreme Danger	No work unless emergency exists. Contact Cardno ATC RSC and Corporate Risk Management Department prior to proceeding. Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
105° to 130° F	Danger	Contact RSC prior to proceeding. Requires strict adherence to ACGIH Heat Stress Guidelines, including use of on-site WBGT equipment. Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
90° to 105° F	Extreme Caution	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
80° to 90° F	Caution	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
Below 80° F	Normal Range	Typical conditions for time of year. Little or no danger under normal circumstances. As always, anticipate problems and work safely.

5.3 Cold Stress Program

This procedure applies to all employees who perform field work in cold environments at risk of cold stress injury and intended to protect workers from the most severe effects of cold stress.

5.3.1 Training

Cardno ATC Site employees have been trained in cold stress as part of their HAZWOPER 40-hour initial training. Site workers will receive refresher training by the SSHO in cold stress safety and health procedures. The training program will include, as a minimum, instruction in the following areas:

- Proper first-aid treatment
- Proper clothing practices
- Proper eating and drinking habits
- Recognition of impending frostbite
- Recognition of the signs and symptoms of impending hypothermia or excessive cooling of the body when shivering does not occur
- Safe working practices

The SSHO will be trained in first-aid, CPR, and cold stress conditions.

5.3.2 Environmental Monitoring

Frostbite and hypothermia are two types of cold injury that personnel must be protected against during the performance of field duties. The objective is to prevent the deep body temperature from falling below

96.8° F and to prevent cold injury to body extremities. Two factors influence the development of a cold injury the ambient temperature, and wind velocity.

The SSHO will monitor environmental conditions by recording ambient temperature and estimated wind-speed. Information contained in Tables 5-1 and 5-2 will be used to evaluate the possibility of hypothermia among workers on-site.

5.3.3 Protective Clothing and Rest Breaks

Use appropriate cold weather clothing when temperatures are at or below 40°F as exposed skin surfaces must be protected. These protective items can include facemask, hand wear, and foot wear. Workers handling evaporative solvents during cold stress conditions will take special precautions to avoid soaking gloves and clothing because of the added danger of prolonged skin contact and evaporative cooling. Personnel will wear protective clothing appropriate for the level of cold and planned physical activity. The objective is to protect all parts of the body, with emphasis on the hands and feet. Eye protection against glare and ultraviolet light should be worn in snowy and icy conditions.

The work rate should not be so great as to cause heavy sweating that could result in wet clothing. If heavy work must be done, opportunities for rest breaks will be provided where workers have the opportunity to change into dry clothing. Conversely, plan work activities to minimize time spent sitting or standing still. Rest breaks should be taken in a warm, dry area. Windbreaks can also be used to shield the work area from the cooling effects of wind.

5.3.4 Identification and Treatment of Cold Stress

When frostbite, hypothermia, or other cold stress symptoms are suspected, treat the patient to relieve symptoms or transport them to the medical facility identified on page TC-4.

TABLE 5-1
Threshold Limit Values Work/Warm-up Schedule
for Four-Hour Shift*

Air-Temperature--Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (approx.)	°F (approx.)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-26° to -28°	-15° to -19°	(Norm. Breaks) 1		(Norm. Breaks) 1		75 min	2	55 min	3	40 min	4
-29° to -31°	-20° to -24°	(Norm. Breaks) 1		75 min	2	55 min	3	40 min	4	30 min	5
-32° to -34°	-25° to -29°	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
-35° to -37°	-30° to -34°	55 min	3	40 min	4	30 min	5	Non-emergency work should cease		Non-emergency work should cease	
-38° to -39°	-35° to -39°	40 min	4	30 min	5	Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease	
-40° to -42°	-40° to -44°	30 min	5	Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease	
-43° & below	-45° & below	Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease	

- *1. Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up periods of ten. (10) Minutes in a warm location and with an extended break (e.g., lunch) at the end of the 4-hour work period in a warm location. For Light-to-Moderate Work (limited physical movement): apply the schedule on step lower. For example, at -35°C (-30°F) with no noticeable wind (Step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (Step 5).
2. The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph: light flag moves; 10 mph: light flag fully extended; 15 mph: raises a newspaper sheet; 20 mph: blowing and drifting snow.
3. If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be 1) special warm-up breaks should be initiated at a wind chill cooling rate of about 1750 watts per square meter (W/m^2); 2) all non-emergency work should have ceased at or before a wind chill of 2250 W/m^2 . In general, the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart slightly overcompensates for the actual temperatures in the cooler ranges because windy conditions rarely prevail at extremely low temperatures.
4. TLVs apply only for workers in dry clothing.

* Adapted from Occupational Health & Safety Division, Saskatchewan Department of Labor.

TABLE 5-2
Cooling Power of Wind on Exposed Flesh Expressed as
Equivalent Temperature (under calm conditions)*

Estimated Wind Speed (mph)	Actual Temperature Reading (degrees F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent chill Temperature (degrees F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds > 40 mph have little additional effect)	LITTLE DANGER If < hr with dry skin. Maximum danger of false sense of security				INCREASING DANGER Danger from freezing of exposed flesh within one minute.			GREAT DANGER Flesh may freeze within 30 seconds.				
	Trench foot and immersion foot may occur at any point on this chart.											

* Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA

6.0 - SITE SECURITY AND CONTROL

6.1 Work Zones

Restricted Site areas will include, but not necessarily be limited to, the following zones:

- **Exclusion Zone or Hot Zone** - any area where contamination is either known or likely to be present in concentrations that could pose a threat to human health and safety or that potential for harm to personnel exists because of the type of work activities being conducted. Appropriate PPE and warning signs should be utilized in this area.
- **Contamination Reduction Zone** - any area where workers conduct personal and equipment decontamination.
- **Support Zone** - areas where access is controlled, but the chance to encounter hazardous materials or conditions are minimal.

Access to the work zones will be controlled by work zone delineators (e.g. traffic cones, flags, vehicles, DOT approved devices, temporary or permanent fencing, and/or safety barrier tape). Figure 6-1 is an example of a work zone. Additionally Cardno ATC employees should follow the requirements of the Employee Health and Safety Policy Manual, Policy No. 36, Work Zones in Traffic Areas for additional information.

In the event on-site personnel must upgrade their personal protective equipment, the work zones may require substantial modification in order to provide for the safety of nearby personnel not associated with this work. Any upgrade level will be communicated by the Site Supervisor to the PM. The PM will then inform the RSC of this occurrence.

6.2 Buddy System

The Buddy System will be used at all times by field personnel in the Exclusion Zones. The Buddy System means that personnel work in pairs and stay in close visual contact to be able to observe one another and summon rapid assistance in case of emergency. No one is to perform fieldwork alone without the approval of the Branch Safety Officer and/or the Regional Safety Officer.

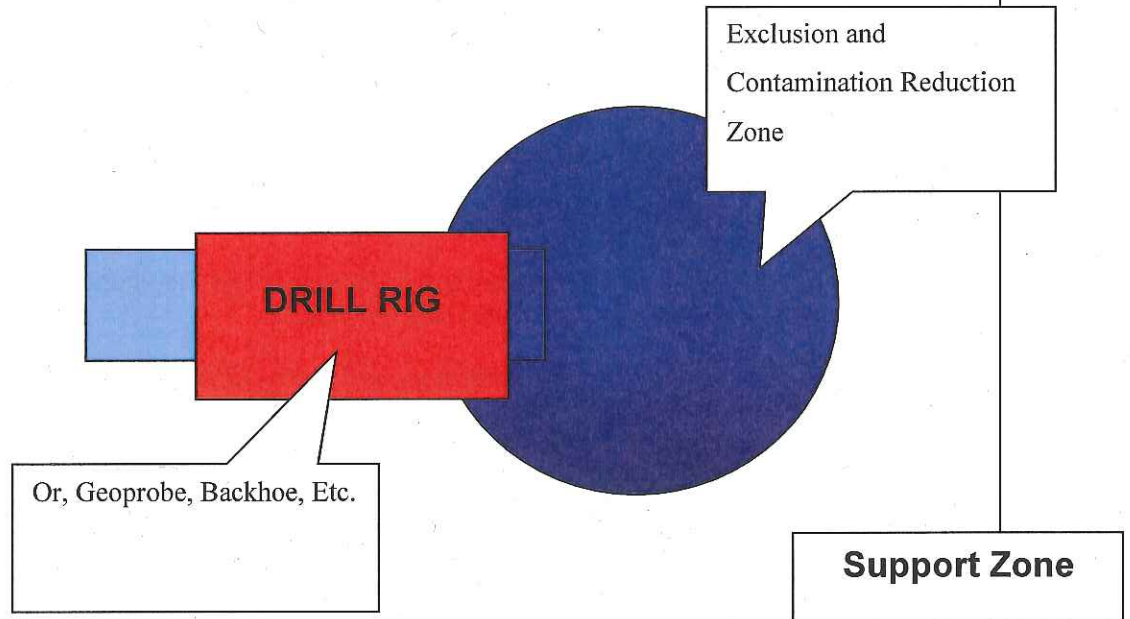
6.3 Site Communication

A loud and clear form of communication should be made available for Site personnel entering the work zones. Site communication may be in the form of hand signals, voice, or other communication devices. All forms of communication should be understood by all workers on the Site prior to starting work.

6.4 Roadway Work Zones

When Cardno ATC employee and subcontractors are required to perform Site operation in a city street or public right-of-way, a Traffic Control Plan may be required and included with this HASP. Check with the State or local government Department of Transportation for when a traffic control plan is required. Traffic Control Plans will include Transition Areas, Activity Areas, and Termination Areas.

FIGURE 6-1
TYPICAL EXCLUSION ZONE



7.0 - DECONTAMINATION PROCEDURES

7.1 Personnel Decontamination

All personnel must complete appropriate decontamination procedures in a way that is responsive to actual Site conditions before leaving the Site. The decontamination of personnel and equipment will be performed within the exclusion and contamination reduction zones. Wash tubs containing an appropriate decon solution and soft bristle brushes will be used to decontaminate personal protective clothing and boots. Deionized water will be used for the final rinse. The SSHO will visually inspect all PPE and other equipment once decontamination procedures are completed. In general, the four types of decontamination solutions to be considered for PPE include:

- Water for removal of low-molecular weight hydrocarbons, inorganic compounds, salts, some organic acids, and other polar compounds.
- Dilute acids (vinegar) for removal of basic (caustic) compounds, amines, and hydrazines.
- Dilute bases (soaps and detergents) for removal of acidic compounds, phenols, thiols, and some nitro and sulfonic compounds.
- Organic solvents for removal of nonpolar compounds (organic).

LEVEL D/LEVEL C

- Establish a segregated equipment drop
- Remove disposable, outer boot covers, if applicable
- Remove chemical resistant, outer gloves, if applicable
- Remove hard hat and goggles, safety glasses, or face shield
- Remove disposable, inner gloves
- Remove full-face air purifying respirator (Level C only)

Each individual will be responsible for inspecting and decontaminating their own respirator in accordance with the Cardno ATC Respiratory Protection Program (Policy No. 27).

At a minimum the hands and face of each employee must be thoroughly washed upon leaving the work area. Trash receptacles will be provided for all disposable clothing. Commercial laundries or cleaning establishments that decontaminate clothing or equipment will be informed of the potentially harmful effects of exposure.

7.2 Equipment Decontamination

The subcontractor will decontaminate field equipment according to the work plan. This may include manual removal of gross contamination with shovels or other tools, followed by a high-pressure, hot water sprayer. Because decontamination at the high-pressure, hot water station poses the possibility of a splash and/or mist inhalation hazard, the task should be performed using Level D personal protective equipment at a minimum.

Field tool including split-barrel soil samplers, brass liners, and sample knives and trowels will be decontaminated. The field tools may be scrubbed visually clean using a detergent solution (Alconox/Liquinox) with water and a stiff, long-bristled scrub brush. Following the solution scrubbing, the tools may be rinsed with distilled water or isopropyl alcohol.

7.3 Disposition of Decontamination Wastes

All materials and equipment used for decontamination should be disposed of in accordance with local, State, and/or Federal Regulations. Clothing, tools, buckets, brushes, and all other equipment that is contaminated must be properly packaged and stored on the Site until disposal arrangements are finalized. Clothing not completely decontaminated on-site should be secured in plastic bags before being removed from the Site.

8.0 - STANDARD OPERATING PROCEDURES

The following Standard Operating Procedures (SOPs) will be applied to each location and activity where work is performed on a hazardous chemical site. As hazards increase or decrease on the Site, the applicability of each SOP must be determined by the SSHO with the approval of any changes by the Project Manager or the RSC.

8.1 Personnel Precautions

1. Eating, drinking, chewing gum or tobacco, smoking, and any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in the exclusion and contamination reduction zone or in any area known to be contaminated.
2. When decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garment is removed.
3. Contact with contaminated or suspected contaminated surfaces should be avoided. When possible, do not walk through puddles, leachate, or discolored surfaces; kneel on the ground; or lean, sit, or place equipment on drums, containers, or the ground.
4. Medicines and alcohol can increase the effects from exposure to toxic chemicals. Personnel should not take prescribed drugs at hazardous waste operations where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified physician. Alcoholic beverage intake should be minimized or avoided.
5. All personnel must be familiar with Standard Operating Procedures and any additional instructions and information contained in this HASP. All visitors and subcontractors will read the HASP before entering the Site.
6. All personnel will be aware of symptoms for heat or cold stress.
7. All personnel will be familiar with the chemicals used on-site and the associated hazards as described in each respective MSDS. The MSDS for the chemicals on-site will be available and located in the company vehicle.

8.2 Operations

1. All personnel going to the Site must be adequately trained and thoroughly briefed on anticipated hazards, equipment, safety practices, emergency procedures, and communications.
2. Personnel on the Site must use the Buddy System when engaged in Level C work as specified in Cardno ATC Policy No. 35 (Hazwoper). The purpose of the Buddy System is to provide rapid assistance to employees in the event of an emergency.
3. Visual contact must be maintained between pairs of Site and safety personnel. Entry team members should remain close to assist each other during emergencies.

4. Personnel should practice unfamiliar operations before the actual procedure.
5. Entrance and exit locations must be designated, and emergency escape routes delineated. Warning signals for Site evacuation must be established by the SSHO before field activities.
6. Communications using radios, hand signals, or other means, must be maintained between initial entry members at all times. Emergency communications should be prearranged in case of radio failure, the necessity for evacuating the Site, or other reasons.
7. Wind indicators visible to all personnel should be strategically located throughout the Site.
8. Personnel and equipment in the contaminated area should be minimized, consistent with effective Site operations.
9. Work areas for various operational activities will be established.
10. Procedures for leaving a contaminated area will be planned and implemented before going to the Site. Work areas and decontamination procedures will be established based on expected Site conditions.
11. Frequent and regular inspections of Site operations will be conducted by the SSHO to check compliance with this HASP. If changes in operation occur, the HASP must be modified to reflect these changes.
12. All electrical equipment (power tools, extension cords, instruments, radios, etc.) will conform with Cardno ATC Policy No. 12 (Electrical) The SSHO will ensure that electrical equipment is free from recognized hazards that may cause physical harm to employees.
13. Fire prevention and protection (appropriate signs for flammable liquids, smoking areas, storage areas of combustible or flammable materials, etc.) will be according to Cardno ATC Policy No. 18, Fire Protection.
14. Site Tailgate Safety Meetings will be held daily to discuss anticipated Site conditions and daily activities. This meeting will be summarized in field logbooks and the Tailgate Safety Meeting Form (see Appendix C).

9.0 - CONTINGENCY PLAN

This chapter of the HASP describes potential emergencies at this Site and the procedures for responding to those emergencies.

9.1 Medical Emergencies

1. The name, address, telephone number, travel distance, and travel time to the nearest medical treatment facility are found in the Emergency Information section (see Page TC-4) of this HASP. A map and direction for locating the facility is available in the Emergency Information section (see Page TC-6) of this HASP.
2. Emergency routes will be verified and driven before any Site activities. It may be quicker to transport a person with minor injuries than to wait for Emergency Medical Services (EMS) to respond. Check with the local authorities for response times. Life threatening emergency situations will only be handled by emergency medical services.
3. Before mobilization on-site, the Site Supervisor will contact the local hospital emergency room personnel, local fire department, and local police department to brief them regarding the scope and hazards associated with the scheduled fieldwork. If the Site is outside an established town, contact will be made with county officials and local emergency services.
4. An emergency first-aid kit with contents per Cardno ATC Policy No. 20 (First-Aid) will be readily available on the Site, and personnel will have first-aid training. The first-aid kit also contains equipment necessary to protect first-aid providers against exposure to bloodborne pathogens. All first-aid providers will have received Bloodborne Pathogens training and can receive Hepatitis B vaccinations according to the Cardno ATC Policy No. 09 (Bloodborne Pathogens) if exposed to bodily fluids.
5. Any person who becomes ill or injured in the exclusion zone must be decontaminated as well as possible with consideration to which risk will be greater, the spread of contamination or the health of the individual. If the injury or illness is minor, full decontamination (remove contaminated clothing and wash hands and face with soap and water, See Section 7.0) should be completed and first-aid administered before transport. If the patient's condition is serious, at least partial decontamination should be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket). First-aid should be administered while awaiting an ambulance or paramedics.
6. The following steps should be followed if an injury or illness case occurs:
 - Check the Scene.
 - If safe to do so, check the condition of the injured.
 - Call 911 if the victim is unconscious or your training dictates to do so.
 - Care for the injured. Always use "Universal Precautions".
 - Call COMP-CARE (800) 756-1130, if the injury is non-life threatening. COMP-CARE will assist you with the location of the nearest clinic, if referral is needed.

7. Provisions must be made to identify the substance to which the worker has been exposed. This information must be given to medical personnel.

9.2 Emergency Equipment

1. A personal eyewash unit that meets ANSI Z358.1-1998, Section 6 will be available in each Cardno ATC field vehicle at the Site if corrosive chemicals (chemicals with a pH of <3 or >11) will be on-site.
2. An emergency first-aid kit with contents as per Cardno ATC Policy No. 20 (First-Aid). The Site Supervisor shall be trained and certified in first-aid and CPR.
3. An emergency spill cleanup kit will be available at the Site at all times. Unplanned releases will be reported to the SSHO and/or Site Supervisor as soon as possible.
4. Sufficient water and/or multipurpose dry chemical (Class A, B, and C) fire extinguishers, rated not less than 2A:10B:C, will be maintained on the Site to cope with any situation until emergency services arrive.

9.3 Flammable Conditions

In the event that combustible vapors exceed 10 percent of the LEL or strong odors are detected in the borehole, the following actions should be taken:

- Continue investigation using extreme caution. Personal protective equipment may need to be upgraded.
- Allow vapors to dissipate or use intrinsically-safe mechanical ventilation.
- If atmospheric conditions do not change, call in the listed sequence:
 - Project Manager
 - Regional Safety Coordinator
 - Fire Department
- Provide answering personnel with the call back numbers, locations, directions, and situation assessment.

9.4 Site Evacuation Conditions

The following conditions will necessitate the cessation of field work in the area of concern, withdrawal from the work area, and revisions to this HASP:

- Fires and/or explosions
- Unexploded ordnance is detected
- A major incident or injury occurs
- Flammable atmosphere readings above 10 percent LEL
- Oxygen readings above 23.5 percent oxygen concentration
- Oxygen readings at or below 19.5 percent oxygen concentration
- PID readings over 50 ppm sustained for more than 5 minutes
- Detector tube readings over the maximum Action Level for the contaminant specified

9.5 Emergency Communication System

Emergency contacts and telephone numbers are provided at the beginning of this HASP. Field crews will have some communication device at each active work location. These may include radios, mobile telephones, or walkie-talkies. Such communication devices will have sufficient range to contact the field office and/or emergency services. If an emergency occurs on-site, the Site Supervisor is responsible for checking that appropriate emergency contact has been notified. At the time of the emergency response, the Site Supervisor or designee will brief the emergency personnel on the status of the emergency, including Site conditions.

Field personnel will use hand signals if there are noisy working conditions on the Site. The hand signals that will be used are shown below and will be reviewed by the SSHO during the on-site safety briefing.

Signal	Meaning
Hands on top of head	Need assistance
Grip partner's wrist or place both hands around partner's arm	Leave area immediately
Thumbs up	OK; I am all right
Thumbs down	No; Negative
Hand gripping throat	Cannot breathe; Out of air

9.6 Emergency Response Follow-Up

If there is an incident, near-miss, or emergency response, the SSHO will notify the Project Manager and Regional Safety Coordinator. The Project Manager or the Branch Safety Officer will complete a Supervisor's Investigation Report (SIR) (Policy No. 51; Appendix 51-1) and submit to the appropriate Regional distribution list. Prior to resuming work, a Site safety meeting should be held to discuss the circumstances surrounding the incident and what should be done to prevent a re-occurrence.

10.0 - EMPLOYEE TRAINING

10.1 Pre-Assignment and Annual Refresher Training

All Cardno ATC Employees and Subcontractors will participate in routine health and safety education and training programs. These programs are designed to provide employees with a thorough knowledge of hazardous materials, health and safety hazard potential, and Federal Occupational Safety and Health Administration (OSHA) requirements published in 29 Code of Federal Regulations (CFR) Part 1910. According to 29 CFR 1910.120(e), Site employees will have received 40 hours of initial Hazardous Waste Operations & Emergency Response (HAZWOPER) instruction and 24 hours of supervised field experience. Attending an annual 8-hour HAZWOPER refresher training session maintains this initial training. It is the responsibility of the Project Manager and each subcontractor's supervising manager to determine if the subcontractor staff meets these training requirements.

10.2 Site Supervisor's Training

On-site Managers and Supervisors on hazardous waste sites who are directly responsible for or who supervise workers engaged in hazardous wastes operations receive, in addition to the initial 40 HAZWOPER training, 8 additional hours of specialized supervisory training in compliance with the OSHA regulations. This training includes training on the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazards monitoring procedure and techniques.

10.3 Site Safety Training and Briefing Topics

The SSHO will conduct Site-specific health and safety briefing for field personnel before the start of all field work. Briefing attendees will include the Site Supervisor, the Project Team, and Subcontractor personnel. At the conclusion of the meeting, personnel are to sign the HASP Agreement and Acknowledgement Form in the Appendices. As additional people are assigned to the Site, it is the responsibility of the SHSO to ensure that new personnel are briefed on health and safety protocols and ensure that they have reviewed and signed the HASP Agreement and Acknowledgement Form. Items to be covered include:

- Site-specific health and safety rules
- Client-specific health and safety rules
- Health effects of various chemicals used on the Site
- Emergency response actions pertaining to operations on-Site

Additionally, daily Site Tailgate Safety Meetings will be conducted to review past activities, plan ahead for new or changed operations, to understand any near-miss and "lessons learned," establish safe working procedures for anticipated hazards, and provide pertinent safety and health training and motivation. The SSHO will complete the Tailgate Safety Meeting Form located in the Appendices.

10.4 Visitors

All visitors entering the designated work zones will be subject to all applicable health and safety requirements during field operations at the Site. All visitors to a work Site will be given the opportunity to review the HASP, will be escorted at all times, and will be required to stay a safe distance from Site activities. The Site Supervisor and/or the SSHO will be responsible for

briefing all visitors on the Site hazards, Site safety precautions, and the Site emergency response plan.

APPENDIX A
Job Safety Analysis (JSA)

APPENDIX B
Chemical Hazard Information

APPENDIX C

List of Approved Amendments/changes

HASP Acknowledgement/Agreement Form

Visitors Log

Tailgate Safety Meeting Form

Air Quality Monitoring Record

Equipment Calibration Log

Checklist for Subsurface Investigation

Monthly Heavy Equipment Safety Inspection Checklist

HEALTH AND SAFETY PLAN (HASP)

List of Approved Amendments/Changes

[illegible]

HEALTH AND SAFETY PLAN (HASP) Acknowledgement/Agreement Form

(All Cardno ATC, Subcontractor & Client Personnel Must Sign)

Client Site Name: QEP Veneer
Project Site No. 86.42684.028H

I acknowledge I have reviewed a copy of the Health and Safety Plan for this project, understand it, and agree to comply with all of its provisions. I also understand I could be prohibited by the Site Health and Safety Coordinator or other Cardno ATC personnel from working on this project for not complying with any aspect of this Health and Safety Plan:

[illegible]

HEALTH AND SAFETY PLAN (HASP)

Visitors Log

Client Site Name: QEP Veneer

Project Site No. 86.42684.028H

[illegible]

HEALTH AND SAFETY PLAN (HASP) Tailgate Safety Meeting Form

Site Name & Number: QEP Veneer
 Cardno ATC Project No: 86.42684.028H
 Work Being Performed: _____
 Date & Time of Meeting: _____
 Name of Presenter: _____

NOTE: On the initial day of the project, the Project Manager or designee should conduct a visual inspection of the project site (using the Site Safety Checklist) prior to the Tailgate Safety Meeting. This inspection should include a review of project site equipment, hazards, and specific job tasks, activities or operations to be performed for that day. These specific items must be covered during the Tailgate Safety Meeting. For subsequent days, any changes to the site or operations must be covered in the Tailgate Safety Meeting. In addition, "Task-Specific" Job Safety Analysis (JSA) for the tasks/activities at the project site must be integrated into the HASP and Tailgate discussions.

Itemize the Specific Topics Discussed (if more space is needed use the back of this page):

- ☐ Are all employees okay?
 ☐ Are all employees physically able to perform their job duties?
 ☐ "Shared Learning" items?
☐ Has PPE been checked?
 ☐ Emergency evacuation area identified?
 ☐ Asked for Sub interactions or questions?

☐ **Client Requirements** - By checking the box to the left, the Presenter of the Tailgate Meeting acknowledges that all Client-specific requirements have been completed for both Cardno ATC and Subcontractor employees.

Participants (if needed, list additional participants on back of this page):

Print Name	Signature	Company	Date

A Tailgate Safety Meeting must be conducted and documented at the beginning of each workday when two or more Cardno ATC employees and/or Subcontractor representatives are present on site. Employees, client representatives and subcontractors who arrive at the site after the Tailgate Safety Meeting has been conducted must be briefed on the topics and acknowledge by signing this form. The JSA must be completed at the beginning of each day when one or more Cardno ATC employees and/or subcontractor representatives are present on a site.

HEALTH AND SAFETY PLAN (HASP)

Air Quality Monitoring Record

[illegible]

HEALTH AND SAFETY PLAN (HASP)

Equipment Calibration Log

[illegible]

CHECKLIST FOR SUBSURFACE CLEARANCE

MUST be filled out PRIOR to the Start of Field Activities

NO subsurface work in road Right of Ways or Off-Site (property boundary) without Written Authorization

Person
Verifying
Each Item to
Place Initials
On Lines
Below and
Sign Bottom
of Page

Site Name QEP Veneer

Site Address: Montpelier, IN

Project No.: 86.42684.028H

To understand and use this checklist correctly you must refer to and follow ATC's Subsurface Investigation Procedures.

Comments

PRE-DRILLING PREPARATION

Review definition of "Critical" and "Non-Critical" areas.

Request as-built drawings, and/or approval to use private utility locator service and/or air knife to locate/protect subsurface utilities.

Obtain Site access agreement.

Pre-plan boring locations.

Establish surface boring method.

Obtain permits and clearances.

Do borehole and utility markouts.

Establish Site-specific Health and Safety Plan

Notify Client, owner, operator prior to mobilization.

If not using Air Knife-type technology, why?

ON-SITE PROCEDURES

Conduct tailgate safety meeting with topics as indicated in procedure.

Read and follow Drilling/Probing procedures

--1. Do Site walk and verify that utility location checklist is complete.

--2. Locate all markouts and planned borehole locations. Start intrusive procedures at least 5 feet away from and perpendicular to utility markouts.

--3. Break surface cover.

--4. Do surface boring to required depth using hand auger, post-hole digger, shovel or "air knife".

--5. If necessary, use alternate procedure for surface boring.

--6. Collect soil samples by hand augering to required depth.

--7. Protect the borehole from pedestrian and vehicular traffic.

*Buried utilities can be found at any depth, but are most often found within the first 5 feet below the ground surface. Proceed slowly and with extra caution when working within 5 feet of the ground surface.

NOTES:

SIGNATURE

DATE

MUST be filled out PRIOR to the Start of Field Activities

NO subsurface work in road Right of Ways or Off-Site (property boundary) without Written Authorization

Site Address: Montpelier, IN If Present --

Site Safety Documents (on-site during activities)

Utility Staking Request Form (properly completed for current scope of work)?

Site Health and Safety Plan?

"Yes or No" Fill Out, as applicable

Yes	No	Ticket # and Expir. Date: #	/	/
Yes	No	Hospital Location Map Available	Yes	No

**Utility Identification "color"
Above Ground (AG) / Buried (B)**

Natural Gas (Yellow) / Staked?

AG / B

Yes No

Electrical (Red) / Staked?

AG / B

Yes No

Telephone/Fiber Optic (Orange) / Staked?

AG / B

Yes No

Cable TV (Orange) / Staked?

AG / B

Yes No

Water (Blue) / Staked?

AG / B

Yes No

Sewer (Green) / Staked?

AG / B

Yes No

Note: If any of the above listed utilities are not marked, contact the Project Manager immediately to discuss.

Identify on a Site Map the Location of ALL Lines & Meters (or actual utility) and Indicate Nearest Building Quadrant (NE, SE, SW, or NW)

NW NE SE

SW

NW NE SE

SW

NW NE SE

SW

NW NE SE

SW

NW NE SE

SW

NW NE SE

SW

Site Feature Located in Closest Property Quadrant (NE, SE, SW, or NW). Also Identify on Site Map.

Significant Site Features

UST system (UST cavity, dispenser islands, piping runs, vent pipes etc.)?

Yes No

Above Ground Storage Tanks – ASTs (dispenser islands, piping runs)?

Yes No

Electrical Transformers?

Yes No

Area Lighting (Pole mounted lighting, etc.)?

Yes No

Signage with electrical power (Business/Company signs, etc.)?

Yes No

Underground lawn/landscaping sprinkler system?

Yes No

Storm drain catch basins / man-ways and potential connecting conduits/lines?

Yes No

"Other" Concerns Located in Closest Property Quadrant (NE, SE, SW, or NW). Identify on Site Map.

Other

Pavement distress (Cracked pavement, "buckled" asphalt, etc.)?

Yes No

*Buried utilities can be found at any depth, but are most often found within the first 5 feet below the ground surface. Proceed slowly and with extra caution when working within 5 feet of the ground surface.

SIGNATURE

DATE

Monthly Mobile/Heavy Equipment Safety Inspection Checklist

This form is to be completed by the qualified operator of the equipment

[illegible]

Inspectors Signature:				
				Date

APPENDIX D

Excavating & Trenching

All Cardno ATC employees and subcontractors shall be trained and be familiar with the OSHA Excavation Standard and the Cardno ATC Employee Health and Safety Policy Manual, Policy No. 16 (Excavation and Trenching) and Policy No. 33 (Subsurface Investigation).

1.0 UNDERGROUND UTILITIES

Prior to any work beginning, the estimated location of utility installations (such as sewer, telephone, fuel, electric, water lines, or any other underground installation) that reasonably may be expected to be encountered during excavation work must be determined prior to opening an excavation. Utility companies or owners shall be contacted and advised of the proposed work and asked to establish the location of the utility underground installations. When utility companies or owners cannot respond to a request to locate underground utilities within 24-48 hours (unless a longer period is required by State or local law), or cannot establish the exact location of these installations, the work may proceed, provided that the work is conducted with caution, and provided detection equipment or other acceptable means to located utilities are used.

When excavation operations approach the estimated location of underground installations (approximately 18 inches from the installation), the exact location of the installations shall be determined by a safe and acceptable means. While the excavation is open, underground installations shall be protected, supported, or removed to safeguard employees.

2.0 ENTERING EXCAVATIONS OR TRENCHES

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a "Competent Person" for evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the Competent Person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence. All inspections made by the Competent Person should be recorded in the field log book.

No person(s) shall perform work in a trench or excavation that contains accumulated water.

2.1.1 Access/Egress

A stairway, ladder, ramp, or other safe means of egress shall be located in trench excavations that are 4 feet or more in depth so as to require no more than 25 feet of lateral travel distance in any direction.

2.1.2 Exposure to Falling Loads

No employee or subcontractor is permitted underneath loads handled by lifting or digging equipment. All personnel shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by spilling or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the equipment is provided with a cab shield and/or canopy adequate to protect the operator from falling materials.

2.1.3 Warning Systems

When mobile equipment is operated adjacent to an excavation and the operators/drivers do not have a clear and direct view of the edge of the excavation, a warning system such as barricades, hand or mechanical signals, or stop logs are required.

APPENDIX D

Excavating & Trenching

2.1.4 Protection from Loose Rock or Soil

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard to personnel in the excavation. All temporary spoil piles shall be kept at least 2 feet away from the edge of the excavation. Spoil piles should be placed to channel rainwater or other run-off water away from the excavation.

2.1.5 Hazardous Atmospheres

All excavations deeper than 4 feet deep and which have the potential to have a hazardous atmosphere or oxygen deficient atmospheres (Less than 19.5% oxygen) must be tested to ensure safe working conditions, prior to entry. Air monitoring shall be conducted in accordance with Section 4.0 of the HASP.

2.1.6 Protective Systems

Each employee in an excavation shall be protected from cave-ins by an adequate protective system except when excavations are made entirely in stable rock or the excavation is less than 5 feet in depth and examination by the Competent Person provides no indication of a potential cave-in. Protective systems consist of sloping or benching, use of trench boxes or other shielding mechanisms, or the use of a shoring system in accordance with the regulations.

APPENDIX E

Lockout/Tagout Requirements & Procedures

1.0 DEFINITIONS

1. Lockout – Involves using a device such as a padlock, blank pipe flange, chain key block, etc. to isolate energy from employee exposure.
2. Tagout – Involves applying a tag to the energy isolating device with written information concerning the date and name of person who applied the lock and tag.

2.0 LOCKOUT/TAGOUT POLICY

This procedure establishes the minimum requirements for lockout/tagout of electrical energy sources, mechanical, hydraulic, pneumatic, thermal or chemical process energy. It is to be used to ensure that conductors and circuit parts are disconnected from sources of electrical energy, locked (tagged), and tested before work begins where employees or subcontractor could be exposed to dangerous conditions. Sources of stored energy, such as capacitors or springs, shall be relieved of their energy, and a mechanism shall be engaged to prevent the re-accumulation of energy.

Lockout/tagout procedures shall be used prior to performing tie-in operations, maintenance, repair or adjustment of any device where exposure to hazardous energy sources may occur.

3.0 RESPONSIBILITY

All effected employees and subcontractors shall be instructed in the safety significance of the lockout/tagout procedure. All new or transferred employees and all other persons whose work operations are or might be in the area shall be instructed in the purpose and use of this procedure. The Cardno ATC Project Manager shall ensure that appropriate personnel receive instructions on their roles and responsibilities. All persons installing a lockout/tagout device shall sign their names and the date on the tag and on the Lockout/Tagout Isolation Record (see Appendix E.1).

4.0 PREPARATION FOR LOCKOUT/TAGOUT

1. Review current diagrammatic drawings (or other equally effective means), tags, labels, and signs to identify and locate all disconnecting means to determine that the source of energy is interrupted by a physical break and not deenergized by a circuit interlock. Make a list of disconnecting means to be locked/tagged.
2. Review other work activities to identify where and how other personnel might be exposed to sources of energy. Establish energy control methods for control of other hazardous energy sources in the area.
3. Provide an adequately rated voltage detector to test each electrical phase conductor or circuit part to verify that they are deenergized. Test the voltage detector to make sure that it is working properly.

5.0 LOCKOUT PROCEDURE

1. Complete the Lockout/Tagout Isolation Record (see Appendix E.1).
2. All affected employees in the area shall be notified that a lockout is being performed.
3. The equipment being locked out shall be shut down using normal shutdown procedures. (i.e. operator's control station, stop button, etc.).
4. Any residual energy shall be identified and dissipated at this time.

5. All equipment energy sources shall be neutralized. (i.e. electrical disconnects shall be opened, valves closed, blanks inserted in piping, springs returned to neutral position, other energy sources as required)

APPENDIX E

Lockout/Tagout Requirements & Procedures

6. The qualified employee performing the lockout shall place his/her personal lock and tag on EACH energy isolation point isolated in Step 4. If more than two (2) isolation points are required to lockout the device, a group lockbox may be used. A tag indicating all persons who applied a lock, date, time, equipment type, and number and duration of lockout shall also be applied at this time. A subcontractor representative and an Cardno ATC employee shall also apply a lock at this time.
7. Test the lockout by clearing the area and attempting to operate the machine or attempting to operate disconnecting means to determine that the operation is prohibited. A voltage-detecting instrument should be used for electrical components. Inspect the instrument prior to use for physical damage and operation.

6.0 REMOVAL OF LOCKOUT/TAGOUT

1. Upon completion of the lockout an authorized employee must check the area for completeness of work. If the employee who initiated the lockout is available, he/she should conduct this inspection.
2. Remove all tools and nonessential items from the area.
3. Replace all guards.
4. Ensure all employees are clear of the equipment/process.
5. Notify all affected employees in the area that the lockout device(s) are being removed.
6. Remove lockout device(s).
7. Restart the machine to insure proper operation.

7.0 GROUP LOCKOUT

1. When multiple isolation points, three (3) or more, must be controlled during a lockout, or when multiple persons (craft) are involved, a group lockout shall be used.
2. Follow the steps for a normal lockout as documented in steps 1-6 above.
3. Each key for the locks used shall be placed in a group lockout box. The group lockbox shall be kept in view of the work being performed when practical.
4. A Job Control Lock shall be installed on the group lockbox by an Cardno ATC Employee. This lock shall remain in place until the lockout has been completed.
5. Each employee shall remove their own lock when their portion of the work is completed or at the end of each shift.
6. Upon completion of the work, the Cardno ATC employee shall inspect the work area for completeness.
7. When all of the conditions of the lockout termination procedures have been satisfied, the Job Control Lock shall be removed from the group lockbox.

8.0 EMERGENCY REMOVAL LOCKOUT/TAGOUT DEVICE

1. If an employee leaves the facility without removing his/her lock and tag, an effort shall be made to notify the employee that the supervisor in charge will authorize the removal of their lock. It must be deemed necessary that removal of the lock is required by at least two supervisory personnel, but only after confirming beyond any doubt it is safe to do so.
2. Verify the employee has left the Site.
3. Check with co-workers.
4. Check the employee's time card.

5. Attempt to reach him/her at home.

APPENDIX E

Lockout/Tagout Requirements & Procedures

6. Verify the employee is not in the equipment.
7. Visually confirm the completeness of work.
8. Contact the Regional Safety Coordinator and the Project Manager.
9. An authorized employee, under the direct supervision of an Cardno ATC Supervisor shall remove the lock.
10. Upon return to the Site by the employee involved, he/she shall be informed of the removal.
11. A review of the incident may be conducted by the Cardno ATC RSC Coordinator to determine any disciplinary actions necessary.

APPENDIX E-1

Lockout/Tagout Isolation Record

[illegible]

